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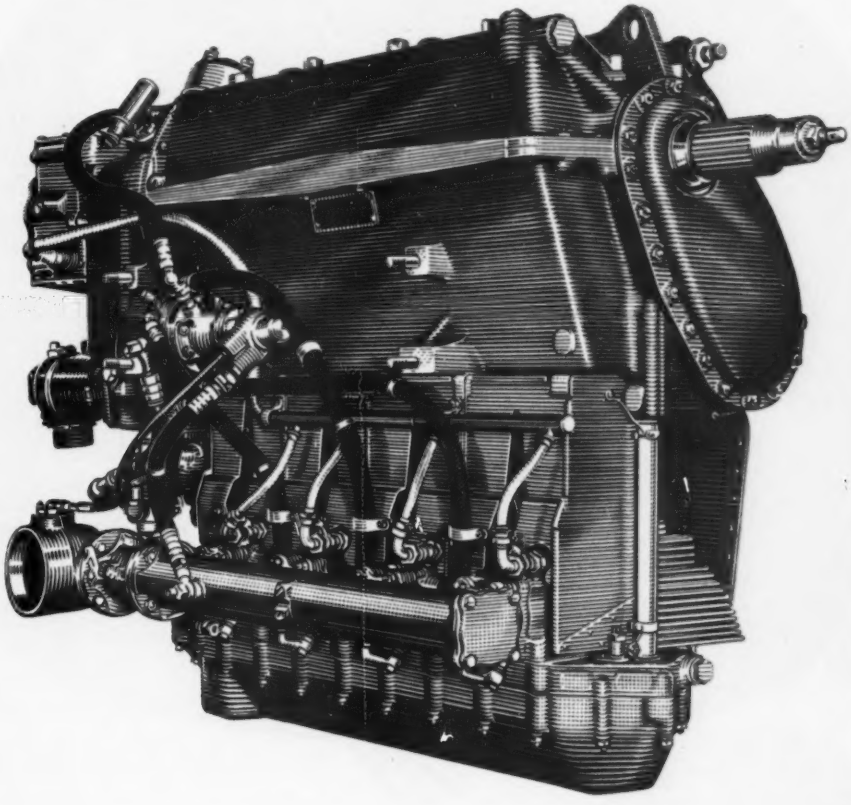

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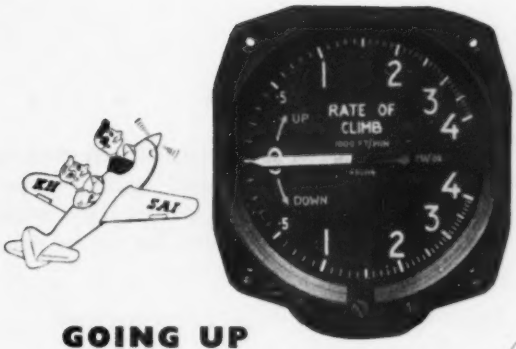

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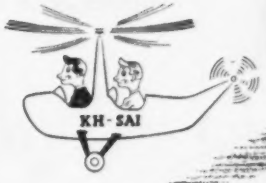

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EDITOR
MAURICE A. SMITH, D.F.C.

ASSISTANT EDITOR
H. F. KING, M.B.E.

TECHNICAL EDITOR
C. B. BAILEY-WATSON, B.A.

ART EDITOR
JOHN YOXALL

Editorial, Advertising and Publishing Offices:
DORSET HOUSE,
STAMFORD STREET,
LONDON, S.E.1.

Telegrams, Flightpres, Sedist, London.
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Future Defences and the Cost

DURING the late war it was, quite rightly, a punishable offence to cause alarm and despondency. That to do so is no longer illegal does not mean that such actions are ordinarily desirable. On the other hand, if a responsible and well-informed person feels that complacency, ignorance or neglect are likely to endanger the safety of the nation, it is plainly his duty to sound a warning. In this way the public are acquainted with the situation, and, if they wish, can make their own opinions felt in Parliament and so seek to remedy any shortcomings; that is the democratic way.

On pages 68-70 there appears the introduction to an important new book, shortly to be published, in which the author, a scientist of standing, gives a grave though timely warning against complacency in planning the country's defences. Everyone would do well to read it, for there emerge many matters of concern to all of us. But here it must be added that many new discoveries and developments remain known to only a few, for obvious reasons of security. Thus, the almost complete absence of news about defensive and offensive missiles, to quote one instance, should not be taken to mean that no such weapons are being designed or built in this country—far from it.

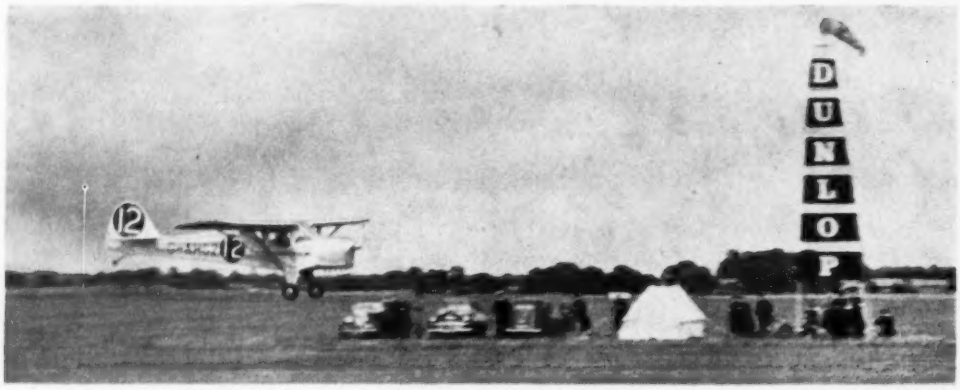
Of particular significance to a country experiencing financial difficulties are the comparisons quoted by the author of the book, Mr. K. W. Gatland, of costs and man-hours involved in producing rocket missiles of the V-2 type and of building and maintaining a jet bomber. In the past, sufficient money has always been found (if tardily on occasions) for essential arms, but this may not always be possible in the future. Nor can we depend on finding great enough productive capacity in an emergency. If, however, unmanned missiles can eventually do the work of piloted fighters and bombers, then they cannot be developed too soon. Fewer lives would be hazarded in the air, fewer man-hours and less money would need to be expended, raw materials would be saved and, possibly, the work of destroying the enemy accomplished even more surely—with mechanical precision.

Already many believe that the Hunter and Swift, so impressively demonstrated at Brussels last week-end, will be the last examples of a long line of single-seat fighters, soon to give way first to manned and partly piloted rocket or turbojet intercepters of a comparatively simple one-purpose nature, designed for vertical launching, and subsequently to pure missiles, unmanned, and guided from the ground.

Sound Sense

A DOCUMENT which deserves study in this country is the report compiled by Mr. James Doolittle's Airport Commission at the request of President Truman; it was reviewed in our pages last week. Among the problems investigated by the Commission was that of aircraft noise, which by its growing and all-pervading nature probably excites more adverse public sentiment than the occasional, isolated accident. In America, the communities affected by the problem are larger and more numerous, and the Commission demands that "efforts be made to prevent further increase in aircraft noise and, where possible, to reduce current noise-level."

Britain's lead in the introduction of jet transports, which rate a high place in the report's list of noise-makers, makes it imperative for us to adopt an equally considerate outlook. No method is in sight of quietening jet take-offs and landings, although the nuisance can be minimized by the use, where possible, of certain techniques and flight-patterns; in this case, one can only trust in the Commission's belief that "reasonable people can be persuaded to tolerate some noise as a part of the cost of living in this age of technology." On the ground, however, there are effective ways of muffling the roar of engine-running, and these should be adopted whenever possible—and incorporated in all future plans for airport-development in populous areas. There are also promising methods of subduing the crackle of airscrew-driven light aircraft—methods which, in the Commission's view, might possibly be applied to heavier machines. The American air-transport industry is now co-operating with the Government and civil organizations in a national programme for noise-reduction, and the results of these studies should be well worth studying with a view to application in this country.



The victor: Gregory dives over the line to win the 1952 King's Cup Race, which was held at the Newcastle-upon-Tyne Airport.

NATIONAL RACES in the NORTH

Cyril Gregory (Taylorcraft) Wins the King's Cup: Private Owners Successful

illustrated by "Flight" photographs

TWO days of first-class racing and air displays rewarded the many visitors who flew to Newcastle—some through storms and very rough conditions—to see the contests for the Grosvenor Challenge Cup, Norton Griffiths and Kemsley Challenge Trophies last Friday, July 11th, and the King's Cup on the Saturday. Strong, cold winds no doubt reduced the public attendance, but some 40,000 visited Woolsington airfield for the two days of the National meeting. The same winds and an occasional heavy rainstorm gave most of the competitors an unusually rough ride.

Private owners met with considerable success and their cash prizes and Ragosine bonuses went far, we hope, towards covering expenses. The meeting was sponsored by the Kemsley Flying Trust, and Viscount Kemsley—who flew up with Sir Miles Thomas in a B.O.A.C. Dove—was among those present. The organization was in the hands of the Royal Aero Club, Newcastle Aero Club, and local authorities.

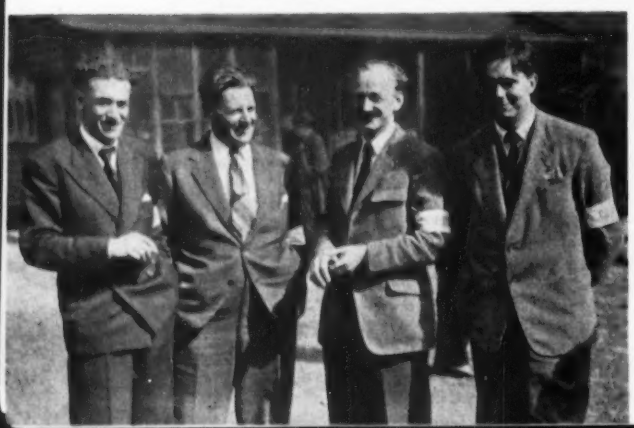
The Friday Races

Frankly, the atmosphere was rather depressing during the hour or two before the three National races (which also formed eliminating contests for the King's Cup) began on Friday evening. Heavy storms were to be seen around the area, the wind was strong and cold and only an occasional spell of sunshine brightened the proceedings. Several of the hardened air-race-goers complained that they could not feel any of the usual race atmosphere and suspense. Fortunately, however, visibility was good, and the weather prospects satisfactory, if lively for the competitors. A few pilots were still having a look at the 32.8-mile course, which was easy to follow and well liked by those competing. A Canberra came over to have a look at Woolsington and the preparations going on there, and Prince Cantacuzene drew all eyes in his direction for a few minutes while he methodically practised parts of his remarkable repertoire.

Field Marshal Viscount Montgomery of Alamein presents the King's Cup to C. Gregory of Sleaford, who flew a Cirrus-powered Taylorcraft Plus D.

And so race time drew near and the public started to arrive. No one appeared to be directing the ticket holders into the carefully fenced enclosures, so Col. Preston in person endeavoured to sort out some of the holders of the various coloured badges; but soon it became apparent that commonsense was more useful than coloured badges, and people were invited to go where they chose in the main enclosures.

Charles Gardner of the B.B.C. now opened up on the loudspeakers to whip up some enthusiasm, and half-a-dozen bookies, somewhat hesitant, started to shout the odds.



Smiling winners: (left to right) W. P. Bowles, Norton Griffiths; T. W. Hayhow, whose Tiger was first over the line in the Grosvenor but subsequently disqualified; C. Gregory, King's Cup and third in the Grosvenor; P. G. Lawrence, Kemsley and third in the King's Cup. (D. F. Ogilvy became the winner of the Grosvenor race in place of Hayhow. Unlucky Lt. S. B. Oliver had been first over the line in the Kemsley race but had clipped a turn.)

The first race, of two laps, was for the **Grosvenor Challenge Cup** (and small replica) and three prizes of £100, £50 and £25 respectively; aircraft weighing less than 750 Kg (1,653 lb) were eligible. First man away was Ogilvy in the well-renovated old Gipsy Major Avro Club Cadet. Twenty seconds later the first pair of Tiger Moths set off after him, to be followed again in 25 seconds by an apparently identical Tiger flown by Hayhow. And so at regular intervals the sixteen competitors took off. Unfortunately both Chiltons and the Tomtit had been scratched.

Much of the handicapping was excellent, but some details were not very easy to understand in this or the other races. There were few really unknown quantities; yet, for example, S/L. Loveridge's Hawk Trainer III had to give a whole minute to Donaldson in the Globe Swift, and the Moth Minor, with only 90 h.p. under its small bonnet needed to do about 120 m.p.h. to be in the running. We do not see the details declared on the entry forms but were fortunate for once to pick the winners of three of the races.

Remembering past performances, it seems that unless a competitor is able to go to the same lengths as, say, Fred Dunkerley in cleaning up and fairing—in his aircraft it is better to leave it alone to all outward appearances. In the Grosvenor Race, P. W. E. Heppell, who is a local pilot, flew a Tiger Moth with front cockpit completely faired in, and a little tidying up of struts and wires was also apparent—result, he had to give 4 min 5 sec in handicap and 3 min 20 sec to Tom Hayhow, who was judged to have the next cleanest (though standard) Tiger. His average speed turned out to be 114.5 m.p.h., which was very good, and 10 m.p.h. better than Snook's leather-upholstered mahogany-panelled version, but he finished only seventh.

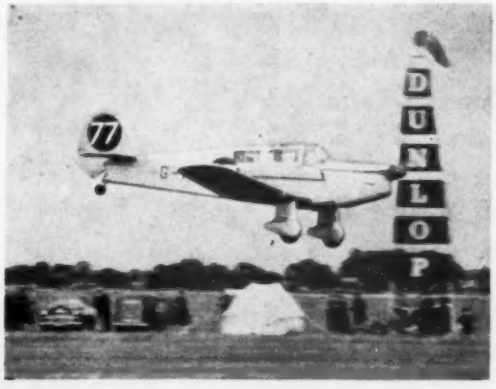
The Moth Minor as a type seems always to be over-handicapped, perhaps because it looks so clean and tidy. Robertson's entry was a pretty single-seater, and it achieved 116 m.p.h. for the race—few people gave it a chance, however, and (but for the Whitney Straights and Loveridge's Hawk Trainer) it was last.

Potential dark horses of the Grosvenor race were Gregory in the Plus D, and Donaldson in the Globe Swift, who in fact came fourth in spite of flying part of the first lap with its wheels down. This is the best we have seen the Swift do, and in spite of the buffeting it received—one could see it bouncing and weaving—it averaged 142 m.p.h.

Two laps does not give much time for changes of position and in all three of Friday's races few competitors gained or lost by more than a place or two, and these mainly during the last lap. In this Grosvenor race, however, Hayhow pulled ahead at once, was second at the half-way point and finally, a fairly easy winner, having coaxed his Tiger—flown head-down and solo from the front cockpit—into achieving well over 110 m.p.h. Ogilvy, first man away, went very well on the old Cadet and held off all followers except Hayhow, to finish second. Gregory smoothly and unobtrusively flew his Taylorcraft into a good third place.

After the King's Cup Race the Gipsy Major engine in Hayhow's Tiger was stripped and found to have domed pistons, giving a slightly higher compression ratio than that for which he had been handicapped. This resulted in disqualification being announced. D. F. Ogilvy thus became Grosvenor winner, Beverley Snook moved up into the prize money at third and Pat Fillingham (Chipmunk) qualified by place instead of speed for the King's Cup race. Unfortunately, R. U. Hummel in the Whitney Straight,

"Sailor" Parker brings further success to Blackburns. He flew Mr. Robert Blackburn's Proctor V entry into second place in both the Kemsley and King's Cup races.



Peter Lawrence in his Proctor I keeps well clear of L. S. Loveridge's Hawk Major III round the Woolsington pylon.

who would have qualified on speed, lost his chance to compete on Saturday. In fairness, it may be added that had Hayhow's Tiger been fitted with a standard engine it would almost certainly, like Snook's, have been ahead of the Whitney Straight. Full results and speeds are tabulated on page 82.

Next came the race for the **Norton-Griffiths Challenge Trophy,** with prize money as for all three races of the day. The ten pilots were all experienced; most of them were familiar opponents. Jimmy Rush and Marler were mounted as usual, and were not expected to have found much more knotage. Dunkerley is always a danger and since we last saw his Miles Mercury (Cirrus Major III) it has been beautifully done-over with everything fairable faired and the roof and screen dropped as on his magic Gemini.

In spite of this, one seasoned customer—Bowles in his clean standard Messenger—seemed particularly well placed with only 1 min 20 sec handicap and only another Messenger and a well-cared-for old Leopard Moth ahead. We put our money on him and expected Hayhow, now flying his many-record-holding and Decca-carrying Aiglet, to get a place, though wondering at the same time if Ron Paine was going to surprise us all, and not forgetting how well Chandler's closed-in Hawk Trainer III went to win the last (1950) King's Cup.

Matthews-Naper, an Australian with Irish-registered Messenger, led off with airline Captain Christie of Norway after him in the Leopard, and Bowles not far behind. Marler, Rush and Dunkerley were all off within a 30-sec period in that order, and it was felt that these three would have a grand private race

First time round it was apparent that Bowles and Chandler were going very well while Christie and Matthews-Naper were making good enough time to stand a chance.

Reports started coming in from the turning points on the last lap, and it was fairly certain that no one would catch Bowles, who was now doing nearly 10 m.p.h. better than the other Messenger. Ron Paine unfortunately cut a corner too close and to avoid being disqualified he turned and rounded it a second time. This lost him his chance of a place in the race, but he was sure of qualifying on speed for the King's Cup.

In a few minutes Bowles's cream machine could be seen on the last mile or two bouncing towards the finishing line, over which he dived at nought feet—the winner by a safe margin of seconds. Chandler in his Hawk Trainer popped up over the edge of the airfield, having contour-chased most of the way, and very close behind were Christie and Hayhow. Jimmy Rush, last year's winner, picked up his 10 seconds on Marler by averaging 2 m.p.h. faster for the race. With exactly the same speed of 161 m.p.h., Dunkerley was only able to hold his starting position of ninth.

The aircraft all landed normally after the race. But what had been happening to Chandler's Hawk? News was round in a moment. He had hit some power cables on the last dash for the line, and a glance at his machine left no doubt that he was a singularly fortunate young officer even to be alive. (He is a flying officer stationed at Tangmere, and was born in Kenya 23 years ago.) The cables had miraculously missed his prop but one had snapped

Competing aircraft assembled beside the runway at Woolsington before the Friday evening races. (Right) David Ogilvy, secretary of the Vintage Aeroplane Club, in the cockpit of the Gipsy-Major-powered Avro Club Cadet in which he won the Grosvenor Challenge Cup and £100 prize.

NATIONAL RACES in the NORTH . . .

across the front cylinder just below the spinner; another had wiped off the bottom engine cowling, bending a pushrod, flattening the exhaust stubs like old toothpaste tubes, and carrying away a venturi. A third wire, or perhaps the same one, had broken across the legs and, in curling back, the two ends had torn a great piece out of the port wing leading edge, and a further piece out of the starboard wing skin. Any doubts about their being power cables were dispelled by the signs of arcing between cowling panels, and flash-marks at one point on the forward fuselage. Tom Hayhow is said to have seen the flash just ahead of him "but thought he was having his photograph taken."

While preparations were on hand for the third race, Prince Cantacuzene thrilled the crowd with his remarkable and carefully calculated aerobatic display in the modified Bücker Jüngmeister.

The Kemsley Trophy, like the others, is an international handicap, but the weight category differs and provides for aircraft of over 1,000 Kg (2,205 lb) at take-off. This year it was almost a Proctor race, even after Lashbrook and Hughesdon had scratched. However, the attractive Italian Ambrosini Supersette was competing, as were the renowned and rugged old Hawker Hart ABMR with Frank Bullen up, and a Vampire 9 with Wilson at the controls. Both Somers and Dunkerley were throttle-bending in their Geminis—Somers' being a little cleaner around the rudder/fin gaps, and having new engine air intakes as compared with last year's condition; Fred Dunkerley's was almost incredibly cleaned up in every respect. In spite of having Cirrus Minor engines of a nominal 100 h.p., he was giving 20 sec to Somers with Gipsy Major 1Cs of some 130 h.p.

An examination of the handicaps and Proctor marks seemed to give P. G. Lawrence a good chance in Tim Wood's old Proctor I, for Is are usually faster than 5s, and about equal to 3s. The Vega Gull had more than a minute and a half to pick up in three laps, while of the big fellows the Vampire's speed was difficult to predict. The Hart should, it was thought, hold the Geminis in spite of nearly a minute to catch up, and the Ambrosini was another unknown quantity with a good reputation for speed, but a big handicap of six minutes to make up over all but the Vampire. This Queen 70/3 Supersette is both larger and heavier than the 225 h.p. Alfa-Romeo-powered S.7 seen previously.

As would be expected in a two-lap race, there was no great change of order at the end of the first lap, but timing showed at once that Oliver and Lawrence were going well, that Sailor Parker might hold out, and that Dunkerley had the legs of Somers, and of Bullen in the Hart.

The Vampire now started up and, after what must have been a painfully long wait, Wilson opened up on the runway as the flag was raised. The Vampire still had a few seconds to wait, but, as Charles Gardner put it, the runway took off under the Goblin's blast, huge clouds of brown dust and large lumps of tarmac tearing off down wind. And so the scratch man was away to the scatter point, snaking through the pylons, and heading down the first leg towards St. Mary's Lighthouse on the coast.

In just over five minutes, the Vampire thundered past in a wide sweeping turn, by which time the Proctors could be seen on the northern horizon approaching their last turn at Stannington airfield, whence final progress reports came in by R/T.

There were some three and a half minutes of suspense as the bunch approached, no one being quite sure which Proctor would appear first, or if the Vampire or even Dunkerley could catch them.

The aircraft could be seen in a bunch straining for the line; but, as the first approached the airfield boundary, it was certain that whichever Proctor it was would win, for it had a clear lead. In a moment Lt. Oliver, of Boscombe Down, flashed by with Peter Lawrence and Sailor Parker almost in formation to follow, and Knox and Dunkerley close behind again, Wilson flashing by three seconds later, and Somers only four seconds after him. So finished an exciting race, with only the Hart and Ambrosini left more than a minute behind on handicap. Wilson's lap at almost 500 m.p.h. in 3 min 55 sec, was the record for the whole meeting, winning for him the **Air League Challenge Cup** and £100.

Soon after the finish it became known that Oliver had been unfortunate enough to cut a corner and was thus disqualified, leaving Lawrence the winner, Parker second and Knox, a Newcastle flying instructor, third. On speed, Wilson, Bullen, Somers and F/L. J. de M. Severne in the Vega Gull qualified for the King's Cup. Dunkerley, fourth, had qualified for a second time for the King's Cup.

Chandler having qualified, but with a badly damaged aircraft, was sportingly offered Hayhow's Tiger (at that time believed to be a winning machine) for the King's Cup, while Dunkerley decided to use his Gemini. The evening programme ended with a Slingsby Sky sailplane display beautifully done by Mr. Gerard Smith, of the Derbyshire and Lancashire Club. (He was towed up by an old tricycle Cygnet), and a parachute descent by the Apex Group.

Spectators went home on Friday trying to decide which of the qualifying pilots might have something up their sleeves for the big race on the following day. When new handicaps appeared, based on Friday's results, the only things that seemed to emerge were that Hayhow, having shaken the handicappers in his Tiger, was likely to be last in his Aiglet, starting behind even the speedy Chipmunk flown by Fillingham; that few people would put their money on Loveridge, who was back with the Proctors; that the Blackburn test pilots, Parker and Lawrence (actually P. G. Lawrence has just joined English Electric) seemed to stand a good chance; and Paine and Dunkerley were still strong possibilities.

According to the odds, Jimmy Rush was a keen favourite with many local people, while visiting pilots seemed to think that the long-handicap Vintage Club Cadet, flown by Ogilvy, might pass Beverley Snook and keep ahead of the field. Gregory's privately-owned Plus D. Taylorcraft, just off C. of A., was fancied by only a few with a little inside gen. Its Cirrus Minor I engine is 18 years old, according to Joe Gadd who checked the number against works records; the well-kept war-surplus airframe is about ten years old.

The King's Cup Race

Most of the aircraft competing in the King's Cup Race were well known to the handicappers and the eliminating races of the previous day served to provide them with yet more precise and up-to-date information on the capabilities of each entry. Rarely, therefore, can a race have been so accurately handicapped.

The un-summerlike conditions prevailing at Newcastle on Saturday were underlined at the briefing by the announcement of a 6,000ft freezing-level—not that anybody wanted to fly at that height, notwithstanding the officially voiced disapproval of would-be cable-cutters. The briefing also emphasized the customary precautions to avoid the possibility of mid-air collision between aircraft taking off and those just completing a lap; the presence of two scatter-points close to the airfield, coupled with the low altitude at which competitors were likely to come in over Woolsington, underlined the necessity for such rules.

By 2.15 p.m., with the start of the race four minutes away, cloud was about seven-eighths and the cold wind was gusting up

NATIONAL RACES in the NORTH . . .

to over 30 knots; but the slower competitors—Snook (Tiger Moth), Ogilvy (Club Cadet) and Chandler (Tiger Moth)—got away without trouble, Chandler's departure showing that his experience of the previous day had not impaired his aptitude for low flying.

Heppell, on the other hand, set course in his Tiger Moth at a good 300ft, while Matthews-Naper (Messenger) executed a near-vertical turn over the first pylon, followed by a further series of steep turns on to his first leg. But cornering methods are far from standardized; many competitors clearly favoured a steep bank even for slight changes of course. After Hayhow had got away, Snook finished his first lap, with Ogilvy closer behind than had been expected. The Proctors then got going and shortly after Lawrence came Chandler's Tiger completing its first lap; as expected, its youthful pilot brought it across the field at about fifteen feet and made an impeccable tight turn round the pylon.

The second Tiger—Heppell's—made a much more gentlemanly approach, but the strong westerly wind threatened to blow it over the pylon; an over-the-vertical turn resulted, from which he nearly slipped into the ground. There was some hectic control movement before the Tiger settled down and it was, indeed, a dicey performance.

Marler and Rush then departed, their Falcon Sixes but fifteen seconds apart. Matthews-Naper came by after his first lap, to be followed by the departing Somers Gemini (1949 winner), Bullen (who roared off in old G-ABMR), and Dunkerley's familiar Gemini. The sprightly old Hart set course in a lively fashion, but the Dunkerley Gemini was seen to be dangling a wheel as it departed. This sort of occurrence is ruinous in a race: much comment ensued, the general theme of which was "Hard Luck Fred."

Next to complete their first lap were Bowles (Messenger) and Bedford (Miles Whitney Straight), followed by Pat Fillingham (Chipmunk), who was catching up fast. Hayhow then passed, apparently quite leisurely; Ron Paine took off very snappily; and then a whole cloud of competitors appeared, some completing their first, and some their second, laps. Parker's Proctor was first; then Loveridge and Lawrence together (the Hawk Trainer below); then Knox, Ogilvy just in front of Snook, Severne, Gregory and Chandler, the last named now at about 10ft altitude.

The Falcons of Marler and Rush were next round, battling hard but still about a quarter-minute apart; they were followed by Somers, Bullen, Heppell (second lap), and Dunkerley, the latter clearly being out of the running, due to his still-unretracted port wheel. Then after Matthews-Naper, came Ron Paine at about 200 m.p.h.; he was followed by Bowles, Bedford, and by Cole's familiar -ABUS, flown by Alington, which arrived at the same time as Fillingham's Chipmunk.

Next to pass were Parker, Hayhow, Lawrence, Knox, Loveridge, Severne, Marler gaining on Rush, Somers, Bullen and Dunkerley, who was by now losing ground appreciably. They were followed by Paine, Ogilvy, Snook, Gregory and Chandler.

The final competitor now appeared on the scene—and with a vengeance. With what seemed an impossible handicap, Wilson brought the Vampire down the runway, and departed in furious fashion, leaving behind a huge cloud of dust and cinders. More sedate aircraft then continued to pass, the order being Heppell, Matthews-Naper, Fillingham; Parker and Bowles together; Bedford; and Lawrence, Alington and Knox all in a bunch. Hayhow

(*Concluded, with tabulated results, on page 82*)

FROM ALL QUARTERS

Britain's Gliding Victory

WITH a total of 4,333 points, Philip Wills has won the 1952 World Gliding Championships, held in Madrid from July 3rd to 12th. This resounding victory, won in the face of strong competition from 17 other nations, is a tribute not only to the pilot, but to the excellence of the Slingsby Sky sailplane and the organization of the British team—captained, as in 1948 and 1950, by Mrs. Ann Douglas.

Second place was taken by Gerard Pierre of France, with 4,048 points, beating F/L. "Jock" Forbes by the very narrow margin of five points. Fourth, fifth and sixth came J. Cuadrado (Argentina), 3,853 points; M. Gehriger (Switzerland), and P. MacCready (U.S.A.). Other British placings were Lorne Welch (ninth) and Geoffrey Stephenson (eleventh). In the two-seater category, the first three were Señor Juez (Spain), Dr. Frowein and Fraulein Hanna Reitsch (both Germany).

Full results of the championships will be given in the next issue of *Flight*, together with the conclusion of our day-to-day report (an instalment of which appears in this issue) of the contests. Meanwhile, we know readers will join us in congratulating Mr. Wills and the entire British team on their achievements.

Swift Point to Point

FLYING to Brussels to take part in last Saturday's NATO display (described on pages 63-64), the Supermarine Swift prototype covered the 200.38 miles between the control towers at London Airport and at Melsbroek, Brussels, in 18 min. 3.3 sec. These times were officially recorded by Royal Aero Club observers in order to submit the flight to the F.A.I. as a point-to-point world record; they represent an average speed of 665.9 m.p.h.

A slight south-westerly wind was blowing, but insufficiently strongly to have any measurable effect on the time recorded. It is interesting to note that the Swift was in no way extended on this occasion; in fact, the fighter was deliberately flown at something less than full throttle to avoid revealing too much of its capabilities. David Morgan, a Supermarine production test-pilot, flew the aircraft; getting away smartly from London Airport, he returned at full speed to pass over the starting line flying level at an altitude below 100 metres, in order to conform to F.A.I. regulations.

The Swift itself was quite standard, and looked especially fast with its lengthy needle nose fitted. This abnormally extended proboscis houses an experimental pressure head for the A.S.I.

David Morgan in the cockpit of the Swift (Rolls-Royce Avon).

Payload Bonus for Bristol 170

GOOD news for operators of the Mk 31 Bristol Freighter is implicit in the announcement that, on July 4th, the Air Registration Board cleared the aircraft for operation at an all-up weight of 44,000 lb—an increase of 2,000 lb.

This increase has been made possible by the use of new-type Dunlop wheels and tyres, employment of which removes certain existing structural limitations. The Mk 31 Freighter at the new gross weight meets the amended 1951 British Civil Airworthiness Requirements, which, incidentally, permit the aircraft to operate rather more advantageously in given conditions. The additional 2,000 lb payload has, as a concomitant, the disposition of 300 gallons of fuel in the outermost wing-tanks, and thus is fully realizable at ranges in excess of 300 miles.

P. G. Lawrence to Fly Canberras

THE successes gained by Mr. P. G. Lawrence, M.B.E., in the National Air Races—first in the Kemsley Trophy and third in the King's Cup—coincided happily with his appointment, officially announced last week-end, as a test pilot in the English Electric team under W/C. R. P. Beamont. Since 1948 he had been chief test pilot at Blackburn and General Aircraft, Ltd.

After having served an engineering apprenticeship at Handley Page, Ltd., Peter Lawrence, who is now 32 years of age, joined the Fleet Air Arm in 1939 with a seven-year short-service commission. He served in operational Swordfish squadrons from H.M. aircraft carriers *Eagle*, *Illustrious* and *Argus*, and from bases in the Western Desert. Later he was posted to the Naval Service Trials Unit, and during two years he made some 450 deck landings by day and night on 25 different aircraft carriers.

In 1944 he was appointed to the Firebrand Tactical Trials Unit for work in connection with single-seat torpedo bombers, which were just brought into service at that time.

Altogether, Lawrence has flown approximately 2,800 hours in over eighty different types.

FROM ALL QUARTERS . . .

Ferrying Fighters to Korea

HAVING visited Japan and Korea, Mr. Gilpatrick, U.S.A.F. Under-Secretary, and General Twining, Acting Chief of the Air Force Staff, have reported to President Truman on the flying of jet fighters to Korea with the assistance of air refuelling. Hitherto, fighters have usually been shipped, but on July 7th, the first of three groups of a wing of F-84G Thunderjets left California and arrived at Hickam Field, Hawaii, after being refuelled in the air. Other groups were to leave on succeeding days. General Twining is reported to have said that the scheme had enabled the Air Force to reduce the time before the fighters could be put into action from 60 days to two or three days.

An Important Première

THE Duchess of Gloucester will attend the first showing of the film *The Sound Barrier* at the Plaza Theatre, London, on July 24th (not July 25th, as previously announced) at 8 p.m. The proceeds from this occasion are to be divided between the R.A.F. Benevolent Fund and the Royal Air Forces Association. President of the première committee is Lord De L'Isle and Dudley, V.C., and Lady Slessor is chairman. Tickets, at 10s 6d to 10 gn, are obtainable from the organizer, Mrs. Madge Clarke, 79 Davies Street, London, W.1, telephone number Mayfair 0525-6.

Transatlantic Helicopters

TWO Sikorsky H-19 helicopters of the U.S.A.F. were due to leave Westover, Massachusetts, this week on the first stage of a transatlantic flight to Europe—the first ever attempted in this type of aircraft. Extra tanks had been fitted and the machines were to make the crossing of nearly 4,000 miles by way of Labrador, Greenland, Iceland and England "in order to prove the feasibility and economy of air delivery to Europe by helicopters." The journey was expected to take about 40 hours' flying time.

Each of the H-19s—which are being delivered to the 9th Air Rescue Squadron at Wiesbaden, Germany—was to carry a pilot and co-pilot. Three of the four crew members formerly flew with the 3rd Air Rescue Squadron in Korea, which has rescued and evacuated more than 5,200 United Nations Servicemen since the beginning of the Korean hostilities.

The H-19 helicopter is almost identical with the Westland-Sikorsky S-55 as now being quantity-produced in this country. It has a maximum flying weight of 7,300 lb and a disposable load of over 3,000 lb. The main rotor diameter is 53ft and the engine is a Pratt and Whitney Wasp of 550 h.p.

Westland Technical Directors

IT is announced by Westland Aircraft, Ltd., that Mr. D. L. Hollis Williams, who joined the board of that company last year as chief engineer, has been appointed technical director. Despite the demands of his new duties, however, Mr. Hollis Williams is finding time to take a further pilot's conversion course on the Westland helicopters. In the post of technical director Mr. Hollis Williams succeeds Mr. Arthur Davenport, who, after a long and distinguished career, feels that the time has come to taper off his activities. He will, however, retain a seat on the board of Westland Aircraft, Ltd.

Mr. D. L. Hollis Williams.

Mr. Arthur Davenport.

THE R.A.F. AND NATO

A Timely Pronouncement by the Chief of the Air Staff

WE compliment our contemporary *Les Ailes* on their publication of an article by Marshal of the Royal Air Force Sir John Slessor, Chief of the Air Staff, to coincide with the NATO Air Display in Brussels, described hereafter.

The R.A.F., remarks Sir John, has three main functions in the North Atlantic Treaty Organization : it has to make its contribution to the integrated Allied Air Force under SACEUR; to play its part in the protection of the Allied sea lines of communication under SACLANT; and to defend the United Kingdom, which is not only the British homeland but a vitally important Allied base in war.

"It should not be overlooked," he goes on, "that the R.A.F. has other responsibilities as well—in the Mediterranean, the Middle East and the Far East which, while not yet within any formalized Allied treaty organization as in the North Atlantic area, are none the less equally vital fronts in the defence against the global menace of militant Communism. The primary object and interest of the Free World is to prevent a 'hot' war. As part of that, we have to ensure that we win the cold war—to stabilize the anti-communist front in the countries this side of the iron curtain in Europe and Asia, to build up confidence among the free peoples, to thwart the familiar tactics of infiltration, encroachment and subversive action and, ultimately, we hope, to extend the frontiers of the free world."

The supreme deterrent to active aggression, says Sir John, and the instrument under whose cover we are building up our strength and holding the line in the cold war, is atomic air power. The R.A.F. can never hope to equal the United States strength in that sphere. But the medium force of Bomber Command is even now playing its small part and will do so to an increasing extent as the new four-engined jet bombers—"the best in the world", as Sir John describes them—come into the line.

"Under the Rome and Lisbon agreements," he continues, "the R.A.F. is scheduled to provide the lion's share of the bomber support of SACEUR's forces, from bases under the cover of the air defence system of the United Kingdom. In addition, we are expanding and re-equipping our tactical air forces in Germany and, together with our old friends and comrades of the Belgian and Dutch Air Forces, are building up a formidable strength in the Second Allied Tactical Air Force—the lineal descendant of the old Second T.A.F., which covered and supported the Armies from the Overlord beaches to the heart of Germany in the last year of World War II."

"Under SACLANT, the R.A.F. has its part to play with the British and United States Navies in the protection of the vital Atlantic life-line. If a third world war should come upon us, the modern submarine would be an even greater menace to our shipping than the old U-boat of the last war. Coastal Command to-day is far smaller than it was when it had the proud privilege of being the major instrument of victory over the U-boat in the crucial year 1943. But it is steadily expanding and re-equipping with the Shackleton, which is proving itself as a first-class anti-submarine aircraft."

The United Kingdom, remarks the C.A.S., has been compared to a great aircraft carrier anchored off the coast of Europe; he continues, "It is, indeed, an air base of first importance, not only for Strategic Air Power but for the support of the Armies and Tactical Air Forces on the Continent. As such it would undoubtedly be a primary target for attack in any future war. Fighter Command has already undergone a great expansion during the last eighteen months, and is closely linked with the air defence forces on the Continent. Our new swept-wing fighters, of incomparable performance, are not yet in the line. But our existing jet fighters are bomber destroyers of the first order, and would give a great account of themselves under the top cover of the Sabres of the Royal Canadian and United States Air Forces now stationed in Britain."

"During the late war the R.A.F. had the privilege of including within its framework contingents of the Air Forces of six of our present NATO partners—France, Belgium, Holland, Canada, Norway and Greece. They proved themselves second to none. Side by side with the great United States Air Force we proved ourselves invincible and irresistible."

Sir John concludes : "We should do so again if ever the disaster of a third world war came upon us. But our first job is to make sure that it does not. That we can do, and I believe shall do, by the primary instrument of Air Power."

NATO in BEING

Drama and Spectacle at the Brussels Display: Sabre and Hunter go Supersonic

"FLIGHT" PHOTOGRAPHS

TITLE notwithstanding, this is not to be a discourse on the benefits and significance of the North Atlantic Treaty Organization and the part played therein by the R.A.F., for that topic has been masterfully handled by the C.A.S. in the preceding columns; it will, instead, attempt to describe the great NATO gathering in Brussels over the weekend.

To attend this inaugural demonstration we came into Melsbroek by Sabena on the second day of the proceedings, and found that —as is too often the case on these Continental occasions—the way past various official obstacles was tortuous. Luckily we were hailed by Supermarine's Jack Rasmussen, who had learned the ropes and who took us along to Major Demoulin, D.F.C. To say that this officer once commanded No. 609 (Auxiliary) Squadron, is to say that our troubles were soon over.

On the Sunday morning—the final day of the proceedings—we brought ourselves up to date with the NATO news, the best of which was that the R.A.F. athletes had been having a real field-day at the Heysel stadium. (Results appear on page 84).

At a ceremony before the grave of the Unknown Warrior in Brussels, the A.O.C.-in-C. Bomber Command, Air Chief Marshal Sir Hugh P. Lloyd, who had flown from Benson in a Canberra on July 11th, had represented the R.A.F.

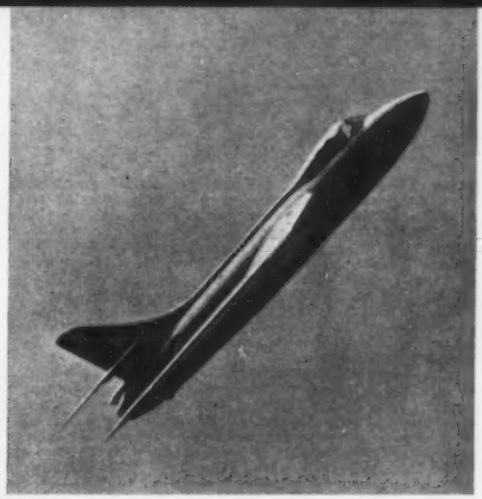
In drill and band displays, in the Grand Place and at the stadium, No. 57 Rifle Squadron, R.A.F. Regiment, had won spontaneous acclaim.

Midday Sunday at Melsbroek saw the NATO flags streaming in a buffeting wind and the populace pressing in at all entrances. We took up our place alongside the royal tribune and towards 3 o'clock the bands and colour guards, in blue, white and khaki, came swinging out in grand style on to the runway before us.

Behind, in the static park, NATO fighters, bombers, trainers and transports were being duly tapped and prodded by interested parties; indeed, one was mindful of certain parties who would have been particularly interested to be afforded a close-up inspection of a Canberra B.2 (placarded speed, 930 km/hr); a Meteor N.F.11 (950 km/hr plus); and a pair of U.S.A.F. Sabres (1,070 km/hr). Also on parade were a Lockheed T-33, a Fairchild Packet, and a Sikorsky S.51 of the U.S.A.F.; a French Dassault Ouragan —actually No. 10 of the series—with finned tip-tanks; a Merlin-engined Fiat G.59 fighter trainer (standing in for the G.80 jet); and various less exotic representatives of the Belgian Air Force.

In ones and twos the assorted diplomats, dignitaries, attachés and Chiefs of Staffs—our own C.A.S. among them—took their places in the royal tribune. Martial strains mingled with the whirr of a hovering Sabena Bell, and the stage was set.

With appropriate dignity the commentator announced the



The Hunter shows its shapely form after making supersonic noises-off.

Left, King Baudouin with Colonel de Greef and Lt. Gen. Leboutte (right).

David Morgan made good use of the Swift's generous flap area.

Salute: R.C.A.F. Sabres making their number at 450 knots.

NATO IN BEING . . .

arrival of His Majesty the King of the Belgians, and the Monarch descended from his car to inspect the guards of honour. So wrapt were most people in this ceremony that they failed to see or hear —for the wind was strong—the approach of fourteen S.V.4 trainers of the Belgian Air Force, streaming the flags of the NATO nations. The Union Jack was worn by the starboard outer machine of the rear vic of seven, and a gallant show the little biplanes made as they battled with the gusts and passed above the King.

Then, almost unnoticed again, a red, yellow and blue S.V.4 came spinning down—on to the stage, as it were—and pirouetted before the tribunes like a dainty little danseuse in a gay dress against a blue backdrop.

This first part of the programme, we should explain, was devoted to the solo acts; and the vivacious danseuse gave way to a veritable virago of a Spitfire 14, clipped of wing and howling with the real old-fashioned Griffon roar. Again and again, between great cart-wheel loops, it bore down the runway between a phalanx of photographers and the royal tribune, its airscrew tips seemingly about to bite into the tarmac like a bandsaw. Should the Spitfire never again be demonstrated before its final retirement, this show, by Capitaine Aviateur de Maere, would be a worthy one by which to remember it. But, of course, we know these Belgian Spitfire artists from ten or twelve years ago.

First of the jets into the arena was Fokker's S.14 side-by-side, Derwent-powered, trainer—silver, blue-topped and yellow-ruddered, bearing Dutch Air Force markings and—with its long A.S.I. boom—thrusting in like a portly but agile war-horse bearing a knight with his lance. Gerhard Sonderman was, of course, the knight, and, true to his custom, he zoomed to gain height for a spin of many turns. The S.14 is a new shape to most eyes and is characterized by an unusual length of nose. It flies like a true Fokker trainer, and Sonderman's eight-point rolls might have been marked off for him by a protractor.

Sonderman made way for Capitaine Aviateur Bodart, whose brief was to "*dévoile les possibilités du Meteor 8*"; and this he did with tremendous zest, in low, tight turns, repeated loops and daisy-cutting passes. Most startling—and more than a little frightening —was the moment when he whipped the Meteor into a vertical bank on the very steps of the royal tribune. We shall have more to say later of the Capitaine and his Meteor.

These low-level gyrations had distracted attention from a lone contrail aloft at—we later confirmed the height—42,000ft. Abruptly the trail ended, and all was peace. Then—Bang, Bang ! —like twin reports of a giant squib behind our left ear. Somewhere a Sabre had gone supersonic. The perpetrator—F/L. E. D. Kelly, R.C.A.F., in a Canadair-built F-86E of 441 Silver Fox Squadron—now came streaking in, trailing a great ribbon of smoke across the field. Pulling up near-vertically, the Sabre flicked round in at least eight turns of an upward roll before being obscured by clouds.

Returning, the "F-quatre-vingt-six" went all coy, mincing along the enclosures like a prim spinster, nose in air, and so conspicuously flapped and slotted as to disguise completely its formerly trim figure.

Now we spotted—with particular satisfaction, for it was a public debut—the more massive form of the Supermarine Swift, bolting up the far runway and ascending at an interceptorish rate. Popular interest, of course, ran especially high by reason of David Morgan's 665.9 m.p.h. positioning flight on July 10th (see page 61); and Morgan gave everyone full money's worth. Like a streak of quicksilver the Swift projected itself near-sonically along the runway before the King, then went hurtling round in tight turns, wherein the big flaps played a part. But never was the impression of speed so vivid as when, at a distance, it was seen flashing over the countryside in a vertical bank—for all the world like a beautiful model swung sharply round on a string.

By this time Neville Duke was off in the Hawker Hunter, and he ascended without delay to the upper air. Again there was a lull, and we had disquieting thoughts of snags. But two staccato bangs reassured us : like a true gentleman, Neville had knocked twice before entering. No longer will he answer solicitous enquiries with his "Still sub-sonic, old boy."

Capt. de Maere enjoying himself in the Spitfire 14.

The tightly-turning supersonic Sabre closes its air brakes.

And so the first British-built faster-than-sound fighter to be adopted for the R.A.F came plummeting out of the blue to shatter everyone's nerves—and any possible doubts about its capabilities.

For some unstated reason the 24 rockets which were to have helped a Grumman Albatross out of Melsbroek failed to fire, and the big amphibian went whining on its way unaided. Soothing to the nerves and, of course, thoroughly impressive, was the ensuing fly-over by twelve U.S.A.F. B-50 bombers, of which the rearmost trailed refuelling booms.

The phase which now opened was a succession of formation aerobatics. Four Belgian Meteors, led by Capitaine Aviateur Bladt, showed how to stick together in true NATO style, and placed their manœuvres to perfection before making their bomb-shell break-up; then, two Vampire teams from 2nd T.A.F. (three with red fuselages and tailplanes, signifying No. 71 Squadron, and three, coloured blue, from No. 3) put the R.A.F. well and truly in the picture with consummate aerobatic formation-changing. This was the more commendable because such practice as these pilots get is mainly out of working hours. The "reds" wound up by threading the needle at runway level before King Baudouin. The 71 Squadron team was led by S/L. O. L. Hardy, and that of No. 3 by F/O. E. D. Blake.

Four pilots of the Aeronautica Militare displayed exquisite Italian craftsmanship with British materials—to wit, Vampires; four Danish Meteors, once they got into their stride, put themselves straightway into the international class; and four French Vampires from Dijon displayed *finesse* and *joie de vivre* in equal measure.

But it was the Skyblazers who once again stole the show—by real smash-and-grab methods. This was their 256th performance and the four Thunderjets showed, it seemed, even more flash and dash and smoke than formerly. In naming their perfectionist pilots we wish them well when they disband in September. In the lead is Major Harry Evans. His wing men are the Patillo twins—both captains; and Capt. Damewood brings up the rear. The Skyblazer formation, incidentally, is not just a "vic and one in the box" : it is a perfect geometric cross of tip-tanked Thunderjets.

The R.A.F kept up their former good work with a single Canberra (F/L. F. W. Howard) which rushed and rumbled round the field in Beamont style though, being a fully equipped squadron machine, it remained strictly non-aerobatic.

Then, in *passages successifs* came the big formations—six Canberras of 101 Squadron, with nine U.S.A.F. B-45 Tornadoes smoking like factories at a lower level; then 48 U.S.A.F. Thunderjets, followed by 24 French machines of the same type; 64 Meteors and 36 Thunderjets of the Belgian Air Force, and eight Danish Meteors; 60 Vampires and 12 Meteors of the R.A.F., and four Norwegian Vampires tailing them. Last, flying far faster and lower (we believe their speed to have been 450 kt) came 12 Sabres of Canada's Silver Fox Squadron, arousing general admiration.

The penultimate event—single-engined aerobatics and relighting by Capt. Bodart in his Meteor—now seemed rather misplaced in he programme; but this proved to be far from the case, for the sleeping Derwent was brought into fiery life immediately before the royal tribune, seemingly epitomizing the Phoenix-like rise of NATO.

As the *apothéose et fin du meeting* 240 Belgian parachutists of the Bataillon Para quit a dozen Dakotas at low level. The wind was still blustering strongly, but these Belgian soldiers are made of the real stuff. We believe that their courage and skill will not soon be forgotten either by their Monarch or by the dignitaries of the Fourteen Nations.

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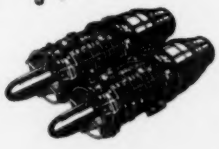

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Smee's

Commercial Aviation Commentary

By HENRY MORRIS

SINCE last writing a Commentary your correspondent has been travelling a great deal, and in that time much seems to have happened. Or perhaps it is more accurate to say that argument and discussion appears to have become livelier and more concentrated on three or four major issues. A stage has now been reached when each of these issues calls for separate and reasoned comment to itself, but here brief thoughts on some of them must suffice.

• • •

FIRST there has been the announcement of the Government's policy for air transport which followed the lines forecast in an earlier Commentary; but a more vague, guarded, and ambiguous statement could not have been imagined—and the recent debate in the House of Lords did little to throw light on exactly what the Government meant or on how far it intends to go to fulfil its intention of giving the independent operators a "slice of the cake" without upsetting the Corporations. The statement can mean a lot or it can mean less than little, but it certainly leaves the Minister plenty of "room for manoeuvre"—which seems to be the aim of the Government on most issues these days. The Government could not have delayed much longer their statement of policy; the Corporations wanted to know to what extent their own future plans might have to be changed, and the independent operators had to know whether or not they were going to have any secure niche in the future pattern of the industry. The Minister has, of his own admission, been too overwhelmed by problems of road and rail transport to devote much deep thinking to this air business, so it was perhaps only to be expected that this initial statement would be vague and indefinite; and that it would seek only to confirm in slightly more definite terms that the Corporations were to continue more or less untouched, but that somehow, somewhere, sometime, the independent operators were to be given some adequate commercial opportunities.

Unfortunately, subsequent exchanges in the Commons and in the Lords have merely shown once more how ill-informed and completely out of touch with the realities of the air transport business are the professional politicians on both sides. There seems to be no happy medium between the inflexible Socialists and the toneless and feet-off-the-earth Tory "overlords". Lord Pakenham surely cannot think that the Government statement gives anyone any scope for "mucking the Corporations about"—and Lord Leathers cannot honestly believe that his gesture to the private enterprise side will be followed by a gushing-forth of gold sovereigns from the City coffers!

Almost the only words of wisdom to emerge from these Parliamentary debates were those of the Marquess Willingdon, who pointed out that the capacity of the United States air transport industry is some twelve times that of the U.K., and that we ought confidently to aim at an expansion of the British transport industry to several times its present size. He contended that there would be plenty of room for an allocation of operating spheres to the independent operators, and sound opportunities on which they could plan ahead, while still enabling the Corporations to expand considerably.

Let us hope that the operators in this country—State and otherwise—will accept this principle and between themselves thrash out a sound scheme for their industry. If they do not do so then the ultimate control will continue to be in the hands of the Civil Servants who, because of the ignorance or lack of interest of politicians, can jog along fairly content that their own pet theories are not likely to be upset.

• •

THE second subject now hotting up is the old one of aircraft procurement for U.K. operators, both civil and military. Transport aircraft have been conspicuously absent from the Government's super-priority list, but at the same time there have been signs that the Government does not intend, either deliberately or by default, to jeopardize the construction of British transports. The Comet and Britannia production is, as far as one knows, proceeding to schedule and there have been references in Parliament to the M.C.A., the Air Ministry and the Ministry of Supply having discussions about aircraft procurement generally, with particular reference to the problem of replacement types for the independent operators.

A healthy British air transport industry, using a variety of British transports, and showing in day-to-day operations that technically and economically they are superior to any foreign counterparts could soon build up a large export industry, and wrest the export markets of the world from the U.S. But it is generally felt that manufacturers cannot now be expected on their own accounts to take the huge financial risks involved in private venture construction of transports.

Thus it was not surprising recently to hear Sir Frederick Handley Page making a plea for the large-scale re-equipment of Transport Command so as to make sure that once again we are not strategically—which also means in due course commercially—dependent on the U.S. for our air transport equipment.

There is some talk about fleets of jets both for the R.A.F. and the Army, so it seems more than probable that Sir Frederick is hoping to cover the development costs of a new jet transport out of home military orders and then go flat out for the military and civil export markets at a competitive price. If this were all to pan out as, apparently, he hopes, then the longer-term needs of the independent operators might also be solved at the same time, for it is likely that Sir Frederick's aircraft would provide the economic characteristics that those operators will need if their future operations were confined to the slender openings the Government appears intent on offering them.

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THIS question of British aircraft production leads on to the third item of increasing interest, namely, what is the U.S. doing about a jet transport? So much has been said recently about the lead we have in this field that there is a danger of a smoke-screen of smugness building up this side of the Atlantic from behind which will emerge a U.S. world-beater. The U.S. may or may not have a jet transport actually under construction. Again, we cannot be absolutely certain that somewhere, under the military procurement programme, a jet is not being built which is virtually the transport prototype. Moreover, America is so advanced in design and production techniques that once a jet design is finally approved everyone may be astounded by the speed with which the first model is completed. If Congress, the U.S. Armed Forces, the U.S. manufacturing industry, and U.S. finance all jointly determine that America is without delay to have the fastest and most economic jet transport in the world then British interests will have to work even faster and, with very high priorities, to keep their lead.

Nearly all the U.S. air transport chiefs have at some time made statements about the poor economic capabilities of the Comet I compared with those of the newer conventional U.S. transports, but some of the latest reports indicate that they are having deep second thoughts about the Comet II. They have had a very good idea of the characteristics of the II for some time past, so what has caused them to view the situation with more concern—if, in fact, they do? It has been suggested that as they have such vast sums tied up in their new fleets of Douglas DC-6s, DC-7s and Super-Constellations they must at least put up a façade of unconcern over the threat from British jets—but this argument hardly supports itself in view of the ease with which they are likely to be able to dispose of such conventional but desirable aircraft to foreign purchasers. So the question boils down

(*Concluded on page 70*)

HERE AND THERE

Sir James Robb at the Palace

HER Majesty the Queen received Air Chief Marshal Sir James Robb at Buckingham Palace on July 8th and invested him with his insignia of office as King of Arms of the Order of the Bath.

Comet Flight for the Duke

THE Duke of Edinburgh, who has already sampled the pleasures of flight in the de Havilland Comet, will renew his acquaintanceship when he returns from the Olympic Games in a Comet of B.O.A.C. on August 4th. The aircraft will call at Oslo *en route*, and will arrive at London Airport on August 5th.

"The Club" Closing

IN accordance with the decision of the Committee, the Royal Aero Club will close from Saturday, August 9th, to Sunday, August 24th (both dates inclusive) for the annual staff holiday. Hospitality will be extended to members by the Public Schools Club and the Royal Air Force Club. The premises at 119 Piccadilly, London, W.1, will reopen on Monday, August 25th.

Link Hydro Trainer

THAT admirable Service journal, *The Roundel*, of the Royal Canadian Air Force, illustrates and briefly describes the prototype Link Hydro Trainer, which is not yet in production. Powered with a 25 h.p. marine-type engine the Hydro Trainer is equipped with the usual flight and engine controls. The maximum height attainable above the water in which the device is operated is about 4ft, and the mounting is a hollow streamlined column which extends to the submerged parts. Span is about 7ft. The Hydro Trainer is designed primarily for use following the Link visual training course.

DC-8 Gossip

AMERICAN Airlines, who are the largest buyers of civil transport aircraft in the world (possibly excepting the Soviet government), are reported to have given the Douglas company "a verbal commitment for a quantity of jet airliners" and interestingly, to be in favour of a straight wing in preference to a swept wing. Not only is the straight wing reported to keep landing speeds low, but it is alleged to permit the carriage of heavier loads. The powerplant of the Douglas transport—a preliminary reference to which appeared in *Flight* of June 20th, and which is authoritatively stated to be on the drawing boards—is generally thought to be the efficient Pratt and Whitney J-57, although General Electric are also in the picture. The "DC-8" designation is not confirmed. There was, incidentally, a DC-8 project some six years ago—a twin-Allison airliner pushed by shaft-driven propellers in the extreme tail.

Sallies from the Rallies

THE recent La Baule and Deauville rallies provided the usual quota of amusing incidents, expressions and literal translations. We recall, for example, the drowsy pilot-pianist who when offered an after-midnight snack replied, "One egg is *un oeuf* for me." While he and other guests sought excitement in small bars and cafés —no one wishing to be *au dessus de son gare*—it was said that there were several 4F men enjoying the luxury of the casino. We discovered that the translation of the symbol was "funds fiddled from the firm." A line-shoot in halting French overheard at the bar was concerned with the "grand avion de bombardement" with which "pendant la guerre" the gentleman concerned had "crumped a poche of Boche" at nearby St. Nazaire.

At La Baule a well-known charter operator hired a Renault 4cv which was promptly christened Olley's trolley. We are now wondering if the International Gliding Contest competitors at Cuatro Vientos have discovered that *cuánto le gusta?* does not mean "what is the wind strength?"

Fast at Low Level, Too

THE Vickers Valiant is frequently to be seen gracing the evening sky over Surrey, and often enough, incidentally, its sound and shape are confused with those of the more familiar Comets, to be seen in increasing numbers in the same area. One evening last week, instead of making its customary leisurely circuit and approach to land, or astonishing climb skywards, the big bomber was seen to make a high-speed low-level run in a southerly direction. It commenced with a gentle dive to about 1,500 or 2,000ft: the four Avons roared, and leaving behind the faint black trail usually denoting high thrust, they propelled the graceful machine towards the horizon with conspicuous lack of delay.

British North Greenland Expedition

NOW on its way to Iceland in the Norwegian sealing vessel *Tottan*, the British North Greenland Expedition will later be assisted by five Sunderlands of R.A.F. Coastal Command and two Transport Command Hastings. The Sunderlands are from No. 230 Squadron and will be commanded by S/L. J. S. Higgins, D.F.C., A.F.C. The first, captained by S/L. Higgins, was due to leave R.A.F. Station, Pembroke Dock, South Wales, on July 15th or 16th, carrying the leader of the Expedi-

BEAU SABREUR: A North American F-86 Sabre bears down on its target at Nellis Air Force Base, near Las Vegas, Nevada, "rippling" its 5in tier-stowed rocket projectiles. One of the R.P.s is seen at the very instant of leaving its pylon attachment on the port side.

PUKKA SAAB: Rocket-laden and wing-tanked, a Saab J-29 (de Havilland Ghost turbojet) gets under way with benefit of Jato. These excellent fighters are now coming off the line at a heartening rate for Swedish Air Force re-equipment.

tion, Cdr. C. J. W. Simpson, R.N., and several other members. It will fly to Reykjavik, Iceland, to rendezvous with the *Tottan*. Thereafter the flying-boat will make such ice reconnaissance flights as may be necessary to locate a clear passage to Young Sound for the vessel. The remaining four Sunderlands, under the command of F/L. C. M. Stavert, will leave Pembroke Dock when the *Tottan* has reached Young Sound, which is expected to be about July 26th.

Old Soldiers

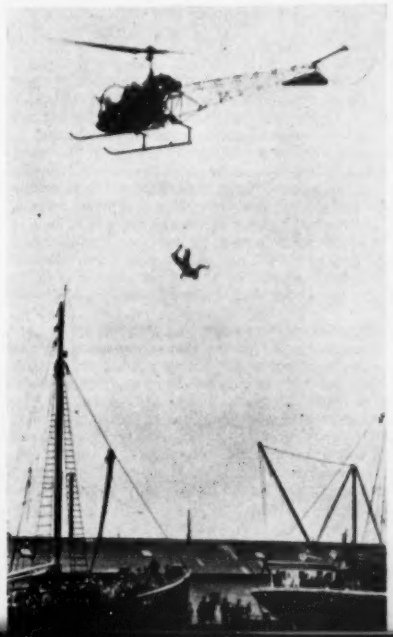
BRITISH readers who followed the fortunes of the Republic Thunderbolts during the war will be pleased to hear that the type is by no means extinct. We hear from the Temco Aircraft Corporation that more than 200 of these big single-seaters are to be overhauled by them under a U.S.A.F. contract—the second continuation of the original contract received in May, 1951. The company has previously "rehabilitated" Thunderbolts for Nationalist China, Colombia and Venezuela, as well as for the U.S.A.F.

The Kindly Albatross

A GRUMMAN Albatross of the U.S.A.F. flew 120 miles from Manston on July 8th to rescue the pilot of a Sabre which had come down in the sea off Hunstanton, Norfolk. The Albatross (U.S.A.F. designation SA-16A) is larger than other Grumman amphibians, having a span of 80ft and a gross weight of about 27,000 lb. It is capable of cruising at speeds as high as 225 m.p.h. and takes off, in windless conditions, in as little as 300 yards.

Freedom of Grantham

THE ceremony of conferring on R.A.F. Station, Spitalgate, the freedom of the Borough of Grantham (Lincs.) which carries the privilege, honour and distinction of marching through the streets of the borough with colours flying, took place on July 10th. The "freedom of entry" was formally presented to the station commander, G/C. S. S. Murray, O.B.E., by the Mayor, Councilor S. Foster, M.B.E., J.P. The R.A.F. Central Band was in attendance, and, as the parade presented arms in the general salute, jet aircraft flew from north to south down the length of the town. Finally, the parade exercised its newly conferred right by marching through the main streets of the town bearing the Queen's Colour of the R.A.F. in the United Kingdom.



BELLYFLOPTER: Seen in passage between the Bell Model 47D and the waters of Svendborg harbour is Mr. Thomas Christiansen, a member of the Danish Olympic Games Diving Team.

News of the Hughes

EIGHT new Pratt and Whitney R4360-4 engines are to be installed in the 300,000 lb Hughes HK-1 flying-boat, which, reports *Aviation Week*, "definitely will be flown" as soon as the new power plant has been installed and tested. No flying is expected until late this year.

U.S.A.F. in Cyprus

THE island of Nicosia, Cyprus, which has been serving as a refuelling and distributing station of the U.S.A.F. for some time past, is now receiving new amenities in the form of two large hangars, which will be used as depots for the Military Air Transport Service. Sometimes as many as ten C-54 Skymasters are bringing in and taking out supplies at this airfield.

A New Zealand Requirement

NEW ZEALAND'S Director of Civil Aviation, Mr. A. E. Gibson, has told the Air Services Licensing Authority in Wellington that there has been a pronounced decline in the number of accidents involving aircraft engaged in top-dressing during the past few years. Mr. Gibson said that the Tiger Moth was not the best aircraft for the job, but investigations overseas for a suitable replacement had not so far been successful. It appeared that a machine would have to be specially designed to suit New Zealand conditions.

Aero Commanders for U.S.A.F.

THREE Aero Commander twin-engined light transports have been ordered by the U.S.A.F. for field testing and evaluation. The Aero Commander is a high-wing, all-metal monoplane with two Lycoming GO-435-C2 engines, which give it a cruising speed of 197 m.p.h. on 70 per cent power, and a range of 1,150 miles with 30 minutes' reserve. It is claimed that the machine can take off and land, at its full gross weight of 5,400 lb, from fields less than 1,000ft long. Initial rate of climb is 1,800ft/min.

IN BRIEF

T. Kendell and Sons, Ltd., Norfolk Iron Works, French Place, Shoreditch, London, E.1, have issued a catalogue giving the essential details of their cutting machines—of the shear, guillotine and rotary varieties—punching machines, and edge tools.

* * *

Iberia, the Spanish airline, are to have 500 Dunlopillo seat-cushions and squabs.

* * *

Dunlop have sent a further donation of £25 to the Air League of the British Empire.

* * *

Mr. W. M. Widgery, F.R.Ae.S., who has been chief engineer of Normalair, Ltd., since 1946, and who was in charge of the early development of cabin-pressure control equipment by the parent company (Westland Aircraft, Ltd.) in the days before Normalair was formed, has been appointed technical director. Mr. N. H. Payne, B.Sc., M.I.Mech.E., is joining the company as chief engineer.

DEVELOPMENT of the GUIDED MISSILE

Economically as Well as Strategically the Rocket is a Significant Weapon: Possibilities of Space-Flight

DURING six years of war, such tremendous advances were made in the techniques of warfare that few of us, casting our minds back to 1939, would have dared then to imagine that jet fighters, long-range rockets and the atomic bomb would appear before its close. Still less did we imagine in 1945 that within a few years two powerful groups of nations would be engaging in an armaments race on a scale that has no precedent or parallel in the whole course of history.

Today, both the United States and the Soviet Union have atomic bombs and the means to deliver them over long range. Jet bombers which will operate at the speed of sound almost 12 miles high and rocket missiles able to project their load at four to five times that speed are already with us; unless measures as revolutionary as those already adopted for attack can be rapidly organized in defence, the advent of a third world war threatens to lay waste large areas of the civilized world.

Every intelligent person shares the earnest hope that war will be averted, but while world tension remains and there is a lack of international agreement on the control of atomic energy, there can be no room for complacency. We cannot afford to delude ourselves about the atomic bomb!

One of Britain's foremost authorities on defence against aerial attack, General Sir Frederick Pile (G.O.C.-in-Chief A.A. Defences, 1939-45), has made the point that "There is every probability that war will not happen and even if it does it is by no means certain that the Russians will attempt to use the atomic bomb on us" (Britain). It has been said, both in Britain and America, that, like poison gas in the two previous wars, the atomic bomb may never again be used against cities. These may be perfectly valid assumptions. We may hope so, but unfortunately there is equal logic in the opposite view, that an aggressor may use atomic bombs to obtain an overwhelming initial advantage in a surprise attack.

Indeed, should a new war open in more dignified style, the use of the atomic weapon from the outset by the United States must be regarded as at least a fifty-fifty possibility. In such a case, it is well to remember that it would be much easier for Russia to strike back at Britain than America, and also much wiser as an initial tactical measure if a quick decision is required in Europe. The lesson that Hitler learned, to his cost, is not likely to be forgotten by a new enemy. On Britain's survival depends not only a powerful fighting unit and an air base for strikes against targets on the Continent and in Russia itself, but a springboard for a possible Allied offensive against the European mainland, should history be repeated in a rapid advance of enemy forces to the Channel coast.

Britain is the bastion of Western defence in Europe and her defection would contribute enormously to the success of an aggressor bent on world domination. There is perhaps no more desirable target in consideration of importance and vulnerability anywhere in the world, and a new war would undoubtedly make this country the target of a determined air attack with the most advanced weapons. Against this threat, we face a task of the first magnitude. Our defence is handicapped from the beginning by a high-density population and the location of our key industrial centres within easy striking range from the Continent. Unlike the United States and the Soviet Union, where defence against air attack can be organized in great depth because of the vast distances to be flown before important targets are reached, the jet bomber allows Britain no such margin. Here, because the striking range is so short, an attack must be met rapidly by fast-climbing intercepters and, at such time as they are available, by guided missiles.

Nor does the danger lie alone in the jet bomber, for in any future war (especially if the Low Countries are occupied) an enemy attack will almost certainly be backed up with long-range missiles.

Readers will recall an unusually interesting series of articles by KENNETH W. GATLAND entitled "Evolution of the Guided Missile," published in "Flight" during last summer. Mr. Gatland is a founder member of the British Interplanetary Society and his articles have now been taken to form the basis of a new book, "Development of the Guided Missile," which is due to be published in a few weeks' time. The author's stimulating introduction, printed below, constitutes a commentary of particular interest at this time and one which on its own provides much food for thought in addition to fulfilling its primary purpose of introducing this new "Flight" book.

This danger is not fully recognized. It is evident from statements in the Press that even responsible military leaders are singularly uninformed on the nature of certain weapons which, in a new war, could have disastrous consequences for this country. These weapons are today neither secret nor radically new; most of them, like the V-2 rocket, were produced in Germany during the war and were subsequently investigated by Allied intelligence teams. The ignorance shown by high authority of their operation and effect (and of the immense potential available in their further development) must give rise to a very real concern.

Too much of our present defensive reasoning appears to be based on outmoded concepts of air warfare; the vertically-launched intercepter has been ignored for years, though it has special significance for Britain, and there is still a tendency in official circles to discount the long-range rocket as a major weapon. There can be no doubt, however, that during the years since the war, the V-2 type rocket has been developed to carry an atomic warhead and that much has been done to improve its accuracy.

In view of these developments, it is important to discover how the long-range rocket compares with the bomber on a production basis. One finds, first of all, that the wartime production cost of a German V-1 "flying bomb" was £3,000 as against £10,000 to £16,000 for a V-2 rocket. The V-2 could be built for about one-sixth the cost and one-fifth the man-hours required for an equivalent bomber, so that although the rocket was always expended in one attack, it was still more economical than a bomber that did not complete four or five missions.

V-2 Production

The methods by which the Germans achieved large-scale production of the V-2, despite a steadily mounting Allied air offensive in 1944, are particularly interesting. The various component parts and sub-assemblies were manufactured in small factories and workshops dispersed throughout Germany and the occupied countries, and the parts were finally brought together at central assembly halls. Nordhausen (now in the Russian zone) was one of the chief assembly centres; there, a disused salt-mine, with tunnels extending for almost a mile and a quarter beneath a mountain, provided an ideal location for assembly lines and workshops. Thus, it was only after the V-2s were completely assembled and in the process of being dispersed to the launching sites that they could be destroyed by bombing.

The V-2 required approximately 30,000 parts in its construction and reached a peak production of 30 rockets per day when man-hours were between 3,000 and 7,000 per missile. The majority of the workers employed on the assembly were slave labourers, Poles, Czechs and Russians, mostly with no previous experience of engineering and at best semi-skilled, and initially the production target was 3,600 rockets per year. Between August, 1944, and February, 1945, however, production had advanced so rapidly that about 3,000 rockets were delivered to the field units in that period alone. This

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DEVELOPMENT of the GUIDED MISSILE . . .

led to a new production target of 5,000 rockets per year. In reaching this figure, it was estimated that 24,000 tons of steel, 5,200 tons of aluminium, 477 tons of copper, 3.2 tons of silver, and 244 tons of various alloys would be required each month. A further 6,000 labourers would be needed to build the new rocket assembly centres, whilst the actual process of manufacture would absorb another 70,000 workers.

These figures are given as an indication of the manufacturing potential available to the Russians who, with their unlimited labour resources, have already turned German wartime methods to good account in aircraft production and, no doubt, will have directed similar efforts into the development of missiles.

There appears to be little doubt that economically as well as strategically the rocket is becoming a significant weapon. The most expensive air weapon in service today is the American B-36 intercontinental bomber, which costs no less than £1¼ million to produce and requires more than half that sum again for replacements (mainly for engines) during a single year of operation. This, of course, is not to compare the merits of the B-36 and the V-2 (the Canberra type aircraft would provide a better parallel in terms of tactical range and payload) but is rather a graphic illustration of the magnitude of effort required by the United States to strike at the heart of the Soviet Union—or, conversely, for Russia to attack the U.S.A.—*as against the comparative ease with which Russia could strike at Britain from potential launching sites situated less than 200 miles from London.*

Accompanying the high cost of production of the bomber is a recurring cost of maintenance throughout its entire operational life which the missile, being expendable, never incurs. And against the high degree of skill required for the bomber, with its ever-increasing variety of complex electronic equipment, the V-2 rocket has shown what can be achieved by a combination of imaginative research, average design ability and vast labour resources of low technical grade efficiently co-ordinated, with a minimum of precision engineering.

The long-range rocket does, in fact, provide a most potent method of attacking this island, and despite the evidence of the wartime V-2, it is surprising to find that even the most elementary features of the weapon are not widely appreciated.

Range

General Sir Frederick Pile, for example, states that "The range of the V-2 is limited and it is inconceivable that for quite a long period after an enemy had reached the Channel coast he could organize a V-2 offensive against this country." Few people who "know their missiles" will agree with him. The V-2 was effective over 200 miles and its launching required no prepared base or emplacement but could be made from any flat surface. In fact, rockets fired against London in 1944 from the Dutch town of Wassenaar, near The Hague, were set up between an avenue of trees, having been moved to the site by road transporters which also served to elevate them into a vertical firing position. These trees afforded perfect camouflage since the rockets were well hidden from the air and the servicing vehicles could be dispersed around the area until they were required in the carefully predetermined sequence of fuelling and servicing operations.

There is nothing to suggest that long-range missiles could not be operated by enemy forces from areas they had recently occupied; transport would be no more difficult than that for any other large type of military ordnance. Indeed, it appears to be a little-known fact that the V-2 rocket *was originally developed as a piece of field ordnance*, its limiting size being determined by the diameter of railway tunnels.

Propellent would be accessible from plants located in Germany and Poland and would be equally transportable by road or rail. In fact, if the enemy possessed adequate defensive air power, there would scarcely be any problem at all in mounting a V-2 offensive against Britain.

Sir Frederick continues . . . "There are very definite limits to the range of the V-2, and these limits are not likely to be overcome in the lifetime of most of us because they entail a completely new means of propulsion which has not yet been envisaged." In fact, as we shall see, the Germans were seeking to extend the range of the V-2 in 1944 by more than 2,000 miles and to this end were considering nothing more advanced than the use of wings and step-construction.

Furthermore, with the United States, Britain and (almost certainly) Russia experimenting with atomic artillery, it is important to realize that such weapons will further enhance the possibilities of long-range bombardment of these islands. Small atomic bombs that can be carried by fighters were made known in 1951, and as warheads for missiles, these would enable London to be attacked with smaller rockets than the V-2, whilst, at the same time, improved range could be obtained without resorting to winged missiles or any improvement of technique. The development of simple step-rockets would bring every important industrial centre in Europe within striking range of Russian forces.

It is a sobering thought that all the fighter aircraft and anti-aircraft weapons which Britain is straining her resources to produce would be powerless to prevent an atomic attack if the main weight of the assault came from supersonic missiles instead of bombers. Yet this possibility cannot be discounted: it would relieve the Soviet Air Force of a major operational task in Europe, permitting maximum attention to be given to tactical support duties and bombing missions against the United States, both of which Russia would have to maintain in strength to achieve success in a global war.

In his book, *Ack-Ack*, Sir Frederick has suggested that had they been given the opportunity, his Command could have destroyed in the air, by means of radar-controlled A.A. fire, at least five per cent of the V-2s fired on London. This opinion was further developed in a series of articles dealing with defence against the supersonic rocket and the atomic bomb, published in a London newspaper during 1951.

Such statements as this can only serve to delude the public on the vital issues, Setting aside for the moment the question of whether or not A.A. fire could, in fact, have dealt with a percentage of the wartime V-2s, it is clearly absurd to think in such terms when we are confronted with atomic and possibly biological warfare. To face these dangers from modern bombers is difficult enough—and we are only now experimenting with anti-aircraft missiles!—but what can be done against supersonic rockets dropping from the sky at 3,000 to 4,000 m.p.h.?

We can agree (at least, in principle) with the General when he asserts that "a controlled projectile is capable of dealing most adequately with jet bombers and fighters," and that "eventually the controlled projective in defence will deal as surely with a rocket flying at 4,000 m.p.h. as it will with a jet bomber flying at 700 m.p.h." Yet, without wishing to overstate the problem, it is difficult to imagine guided missiles capable of dealing even with the jet bomber coming into operational use, in small numbers, before 1955.

The fact remains that unless a determined research effort backed by imagination and skill can be assembled in the field of guided missiles and kindred forms of defence, a full-scale attack upon this country *with weapons that already exist* could not be effectively countered.

The jet bomber is a problem in itself, and it is, to say the least, a little premature for anyone to suggest that against it "we should once and for all write off the fighter."* Indeed, there is a very great deal that can be achieved in the design of piloted intercepters if the necessary support is given to new techniques. First is the provision on present-day fighters of heavier calibre guns and aimed rockets. Long-range self-homing missiles must follow, and the vertically-launched intercepter, offering unique opportunities for shipboard as well as ground launching, appears to be vital in the slow process of evolution towards the fully-automatic guided weapon.

Here, in short, is the problem. At the present time the development of new types of offensive weapons of almost unbelievable destructive power has left far behind the techniques of defence. Our best defensive weapon is the conference table of the United Nations. Beyond that must come strong ground forces to hold an aggressor as far as possible from the Channel coast, which will enable us to overcome to some degree our geographical limitations and arrange defence

* "*Ack-Ack*," *George G. Harrap and Co., Ltd.*, 1949.

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in greater depth against both bomber and rocket. The development of fighters to carry superior armament, and radical changes in their design to permit full advantage to be taken of both engine power and armament, must follow, whilst the production of surface-to-air missiles is speedily set in hand. Finally, one must not overlook the essential role of intruder aircraft—fast, heavily-armed jet bombers of the Canberra class, capable of striking at transport, airfields and rocket-launching sites in enemy-held territory with large-area destruction weapons. These are nothing but the *minimum* requirements for our twentieth-century defence.

There is, of course, a happier side to rocket development in upper atmosphere research and the great possibilities which are now opening up for space-flight. In an address to the International Congress on Astronautics in September, 1951, Dr. L. R. Shepherd, the nuclear physicist, said: "A stage has now been reached in the development of rocket propulsion where, with moderate advances in technique, it becomes possible to produce a manned satellite vehicle and later to proceed to interplanetary flight."

How has this progress come about? History will record that after Professor Hermann Oberth and other pioneers laid the theoretical basis of space-flight in the 1920s, there came a period just prior to the recent war when the first experimental steps were taken by small amateur groups in Germany and America. Then, during the war itself, one man was chiefly responsible for a sweeping advance which at once moved the whole subject into the realms of practical engineering. That advance was the V-2 rocket, and the man was Professor Wernher von Braun, Technical Director of the great experimental rocket station at Peenemunde.

The next step came unexpectedly in 1948 when the United States Secretary of Defence announced the existence of an Earth Satellite Vehicle Programme, having as its initial objective the development of small instrument-carrying rockets to orbit the Earth just beyond the limit of the atmosphere.

Why such rockets will not fall back to the surface may appear puzzling but, in fact, contrary to the popular axiom, everything that goes up need not come down. A rocket that reaches a speed of 7 miles per second (25,000 m.p.h.) will defeat the Earth's gravity and never return. At a lower speed (18,600 m.p.h. at a distance of 500 miles), a rocket can be made to circle the Earth, the inward pull of gravity being balanced by the outward motion of the vehicle (like a ball swung round on a piece of string, if you regard the ball as the rocket and the tension of the string as gravity). Outside the atmosphere, the vehicle will obey precisely the law the Moon obeys in moving round the Earth, and, like the Moon, it can remain in space indefinitely because, being in a frictionless medium, its velocity will always be maintained. A grasp of this elementary principle will lead to an appreciation of the value of orbital technique in the interplanetary project, which is the subject of the final chapter of this book.

What is the purpose of space-flight? Is it likely to be a worth-while venture? One can attempt to answer these questions by listing the benefits that will be forthcoming to science once instruments can be operated in free space. The satellite vehicle will introduce the possibility of an unmanned solar physics laboratory, of chemical and biological research laboratories, with extreme temperatures, zero-gravity conditions and a "hard" vacuum available; the possibility of a meteorological station of unique coverage, relay stations for short-wave radio and television, and an astronomical observatory with greatly improved visibility. All these things have great practical importance but, in the writer's view, the rocket's most outstanding contribution will be in interplanetary flight.

One has only to realize the extent human thought has been influenced by the telescope since the seventeenth century to recognize the enormous impact that space-flight will have in the world of the future. It will usher in an age of unprecedented experience and knowledge—perhaps even of wisdom, when terrestrial affairs are viewed for the first time in their true perspective, against the backcloth of the Universe.

The Ypenburg Display

FOR the fourth year in succession the Royal Netherlands Aero Club are holding their international air display at Ypenburg on August 2nd and 3rd. This "ILSY" display is now established as one of the foremost of its kind in Europe, largely due to the participation of the NATO countries and to the wide range of the programme.

This year, as last, a great number of jet aircraft will be present, including a formation of English Electric Canberras and North American B-45 Tornadoes. The jet-fighter representation will include Supermarine Attackers of British Naval Aviation, Vampires of the R.A.F. and the French Air Force, U.S.A.F. Sabres, Thunderjets from Belgium, the Netherlands and the U.S.A.F., and Gloster Meteors of the Benelux countries. The U.S.A.F. will also send its famous aerobatic team "The Skyblazers," equipped with Thunderjets, and the R.A.F. will also have a special Vampire aerobatic team. Superfortresses and a number of helicopters are also on the list of participating aircraft. Other types which should arouse special interest are the Fokker S.14 jet trainer (an initial order for 20 of which will shortly be placed by the Netherlands Government), a Comet, a Viscount, and a Bristol Freighter of Silver City Airways.

Among the "aerobats" will be the now-famous Harvard squadron of the Netherlands Government Flying School, Louis Nottéghem, Prince Cantacuzene and Major Gerben Sonderman. Sixty parachutists of the Belgian Air Force will jump from two Dakotas.

Commemorating Santos-Dumont

A REPLICA of one of the first powered aircraft ever built—the *Demoiselle* of Alberto Santos-Dumont, the Brazilian pioneer airman—has been flown round the Eiffel Tower prior to being shipped to Brazil. Santos-Dumont made history in 1901 when he navigated one of his airships on a six-mile journey round the tower, near which he resided. The *Demoiselle* was built and flown in 1907; it was made largely of bamboo and had a 20 h.p. engine. The replica, although resembling the original, is built of metal tubing, weighs twice as much, and has a 28 h.p. engine.

It is said that, although Santos-Dumont survived his early flights unscathed, he invariably lost his straw hat. He predicted two-way Atlantic crossings by air "sooner than people realized," and lived to see this dream come true before his death in 1932.

M. Paul Blanc, chairman of the committee which organized a recent commemoration in Paris, recalled: "Santos-Dumont was the most popular man there was at the beginning of the century. Even Lindbergh did not achieve the same popularity. I knew him in 1920 and I was surprised because he then had a fixed idea which prevented him from sleeping. He had the notion that he had an account to settle with God, because his invention had served to build planes which bombed and burned cities and killed men. I am convinced that Santos-Dumont died with this remorse on his conscience."

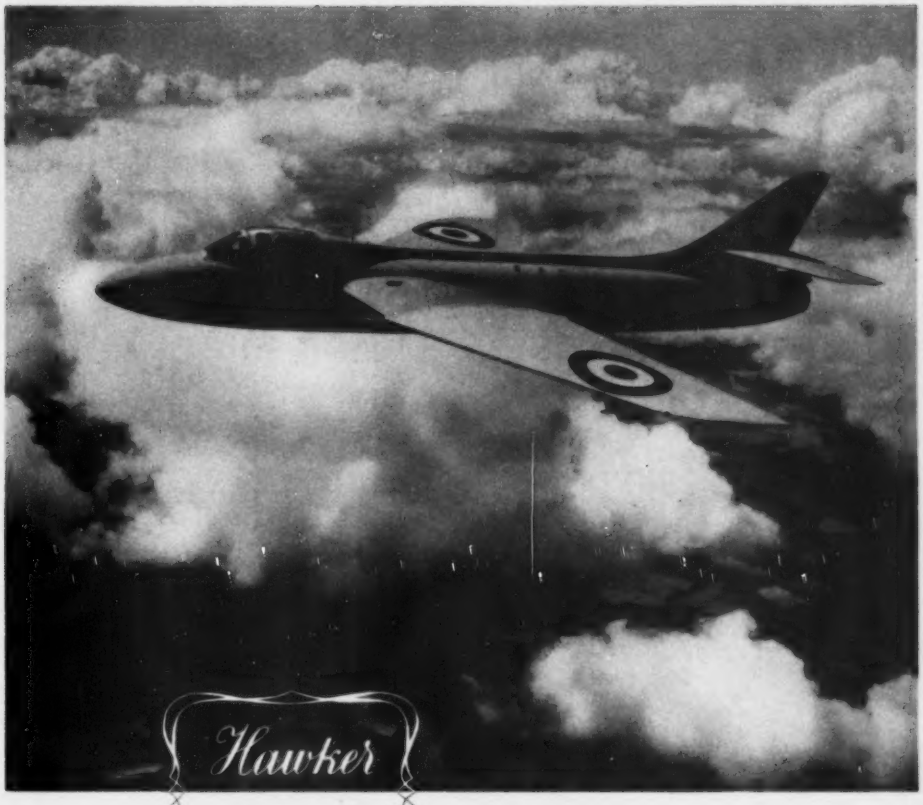
CIVIL AVIATION COMMENTARY

Concluded from page 65

to this: do the U.S. operators think the Comet II is really more economic from both a sales attraction and an operational angle? If they do, then what are they doing about it behind the scenes? They are certainly doing something.

◆ ◆ ◆

To digress from these weighty problems, a gathering which is now becoming something of an annual event was held on Friday the 13th June—at which, incidentally, these very questions were amongst the main topics of discussion. This is the annual gathering of former Imperial Airways' trainees. This I.A.L. trainee scheme produced most of the men who managed the overseas stations on Imperial's routes when international airlines operated in jumps of a few hundred miles from unsalubrious spot to even more unsalubrious spot—interspersed with an occasional paradise! The guests this year were Sir Frederick Handley Page, Captain O. P. Jones, and Major Oliver Stewart—a concourse which inevitably produced some lively exchanges. Unfortunately, these gatherings are very much private assemblies so their proceedings are not recorded—but it is interesting to note that almost all these tough pioneers now occupy stately positions in the industry—which is probably why they do not want any of the many stories told about their youthful escapades to reach the public ear!



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The scene at Escoublac airfield La Baule, with all but the last few aircraft neatly parked beside the long dirt runway.

THE ANDRÉS AT HOME

Most Enjoyable Rallies at La Baule and Deauville

ONCE again Royal Aero Club members, with their families or friends, took off and headed south at the invitation of M. and Mme. André to spend a weekend at one or other, or both, of the delightful French resorts La Baule and Deauville. As Colonel R. L. Preston, secretary-general of the R.Ae.C., pointed out, when he thanked the hosts at La Baule, one needs oneself to have given a weekend party to over 100 guests (or, as was to be the case at Deauville, over 300 guests) to appreciate fully the generosity and hospitality of the Andrés.

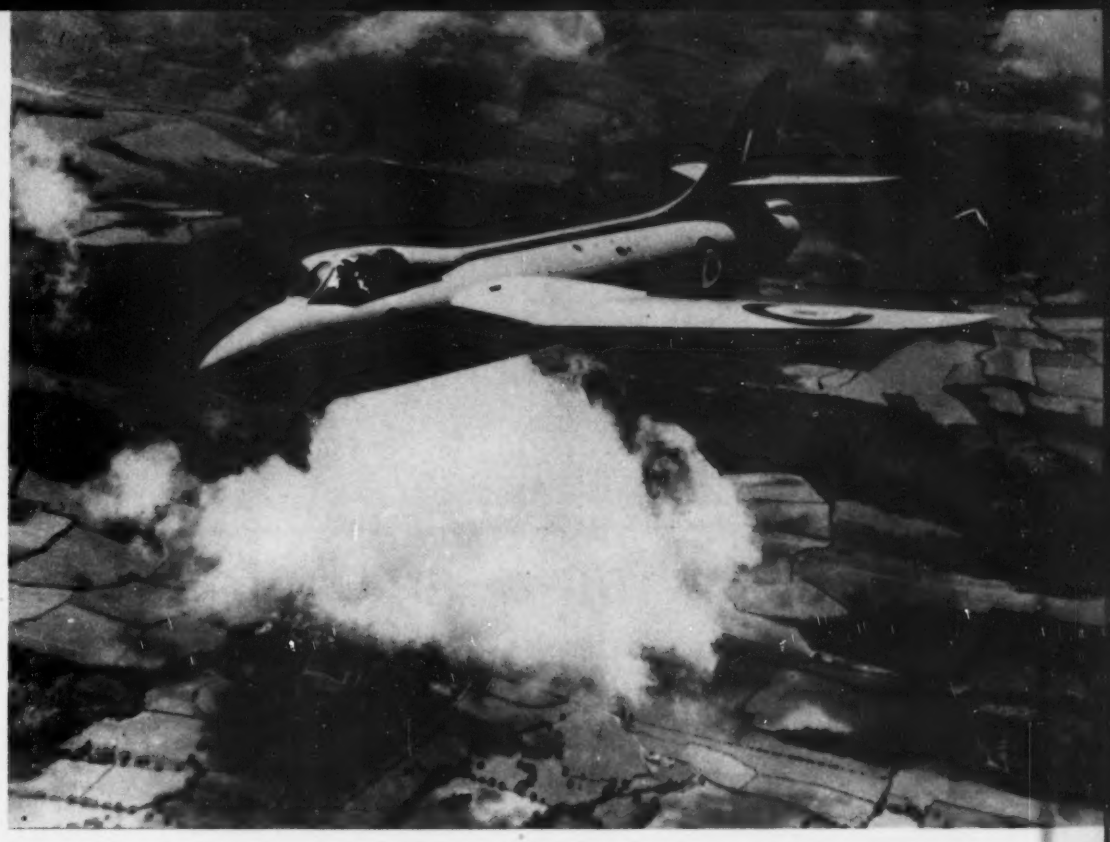
Mme. André had a warm greeting for Air Vice-Marshal George in the casino ballroom.

At La Baule, surely one of the most beautiful of bays in the world, about 130 "aviators" were the guests of Mme. André at the Hermitage Hotel and for a ball at the casino. They arrived in a varied fleet of 47 light aircraft. The weather was perfect; many aircraft enjoyed tail-winds on the way, and it was the consensus of opinion that no La Baule rally has been more enjoyable. The sealed-time landing competition was won by Dr. H. N. Gregg and Mr. S. L. Barnaple in Auster G-AHAM. The time was 4.44 p.m. Thanks are due to M. Droz and M. Vincent, chief organizers on the reception committee, and to Dr. Dubois, the senator-mayor of La Baule. Among the distinguished guests were A.V.-M. George, until recently air attaché in Paris, and Mrs. George; A. Cdre. and Mrs. J. G. Elton who have taken over from them; and M. Jacques Allez, president of the Aéro-Club de France.

The following weekend, July 5th to 7th, more than twice as many aircraft and crews rallied at Deauville—there were, in fact, 106 aircraft and 348 guests. Among the entertainments provided—if more were needed than good food, sunshine and a warm sea—was the brilliant gala dinner at the Ambassadors Casino at Deauville on the Saturday (when prizes for the arrival and other competitions were presented), and a second ball on Sunday night when the Golf Cup was awarded to the R.Ae.C. golf team who this year beat the Aéro-Club de France by three matches. On both these occasions Lord Brabazon, who was a member of the golf team, spoke on behalf of the British guests, thanking M. André for the chance to sample such luxury, especially at a time when the small foreign currency allowance would otherwise have precluded such a visit. At Deauville the arrival-time competition was won by Mr. John Grierson in Procter G-AHMP, while for the best first impression recorded on "landing" at Deauville, the prize was won by Captain Olley who had arrived by bus from La Baule.

St. Gatien airfield now boasts a long concrete runway in addition to grass strips. In this Saturday-evening photograph, most of the aircraft had arrived, although a few were still on their way from Le Touquet and La Baule.

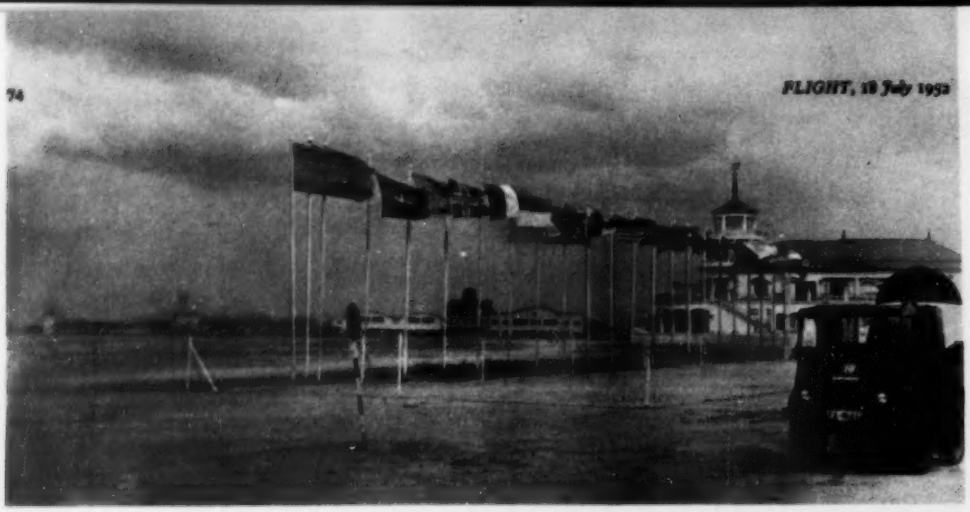
WORTH WAITING FOR



WHEN the Vickers-Supermarine Spitfire and Hawker Hurricane came into operation with the R.A.F. in the late 1930s they endowed that Service not only with an all-round superiority in fighting performance, but in armament also. Never in its annals, in fact, had a comparable advance in speed, climb, manœuvrability and fire power been recorded, and such qualities as were deficient in one of the two new fighters were all the more marked in the other. Proof of this was the resounding victory in the Battle of Britain, wherein the two types were deployed in co-ordinated teams so that they might engage the Heinkel and Dornier bombers, and their escorting Messerschmitt fighters, to the best advantage.

Now, after the passage of years (in which, unhappily, the same superiority in fighting equipment has not been maintained), the whole nation looks forward once more to the introduction of pre-eminent Vickers-Supermarine and Hawker single-seaters. Prototypes of these two machines—the Swift, on the left, and the Hunter, above—are depicted here, and, epitomizing the glories soon to be revived in the R.A.F., a Spitfire—beautiful as ever—further graces the study of the Swift.

It is more than a mere coincidence that both the Swift and the Hunter should accord with ancestral precept in having Rolls-Royce power, for each is fitted with a single Avon axial-flow turbojet; and it is good to know that, just as the Merlin of the Hurricane and Spitfire was developed through a formidable tally of mark numbers to deliver powers far in excess of its original 1,000 h.p., so will the currently quoted figure of 6,500lb thrust be very handsomely surpassed. Thus, the astonishing capabilities of our magnificent new fighters will be further enhanced. Both types were due to show their paces at Brussels last week-end.



The national flags strain at the breeze before the magnificent clubhouse of the Royal Aero Club of Spain.

WORLD GLIDING CHAMPIONSHIPS

The Record of a Colourful Sporting Occasion: Part II

Cuatro Vientos Airfield, Madrid, July 3rd (contd.)

THE task for the day was announced as a free flight in any direction. One mark would be given for each kilometre covered from Madrid, and on such an occasion most pilots fly downwind. The meteorological situation was, however, very complicated. There were "lines of instability" across the country, the winds would blow in contrary directions at various heights, and cloud base would be at about 8,000ft. The met. man was careful not to advise pilots which way to fly and a case could have been made out from the briefing for a flight in any direction.

The British team was divided: Welch, Forbes, Foster and Wills decided to fly to the NE. toward Zaragoza, 160 miles away, while Stephenson considered he would best avoid the bad weather by going SW. toward Badajoz on the Portuguese frontier—a direction in which he had already made a practice flight.

Outside, the sun was already scorching. A light northerly wind rustled the flags of the contestants and, except over the mountains to the far north, no clouds were to be seen. The gliders were being towed across the dusty airfield to be arranged behind the starting line in rows of seven. All 58 arrived with the exception of Stan Smith of the U.S. team (Schweizer 1-23), who had come in only the previous day from America.

At the starting signal seven Spanish Storch monoplanes swung into line before the first row of gliders, were coupled up, and whisked them off, one by one, from the left. As soon as the dust had settled, seven of the Spanish HM-19 low-wing monoplanes, reminiscent of the Klemm, took off with the second row of gliders, and so on until eight rows had been towed off within the hour. There was but one hitch, when the steel cable used by the Spanish for aero-towing parted as Dick Johnson's RJ5 moved off. He joined the last row and was soon chasing the others.

All cast off at about 2,000ft above the airfield, and the 57 soon vanished from sight in a sky which was rapidly developing clouds. The first radio reports from our gliders to their trailers, which were already driving fast along beneath them, showed that three of them had soon reached 10,000ft and were going well up to the north-east. Over the mountains on the horizon one cloud developed into a vast cumulo-nimbus, and the anvil haze spread slowly southward over the airfield. Cumulus was developing in the middle levels and approached from the opposite direction. The wind at Madrid remained light for some hours, but by 5 p.m., when news of the first landings was coming in, the sky had clouded over and a very strong, cool, northerly wind suddenly swept across the airfield, raising clouds of dust and continuing to blow hard for several hours. The clouds above were still seen to be moving in the opposite direction.

Wolf Hirth, the famous German pilot and designer, looks on.

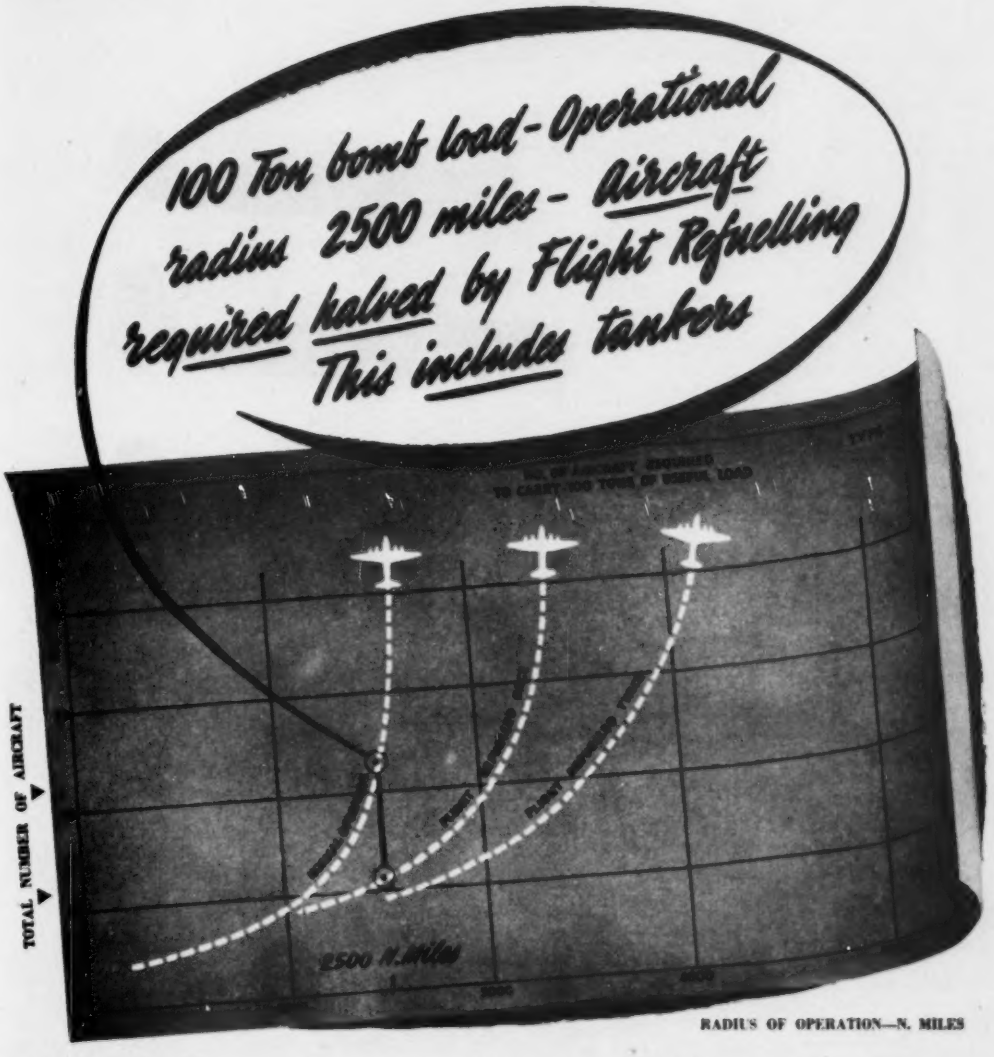
What were the pilots making of these freak winds? By 6.30 p.m. more news came in. Stephenson had found headwinds and was down early. The news from the north-east was worse for Great Britain: Frank Foster had been forced down in the gale, had hit a telegraph pole and had badly damaged his Sky. Lasch, of South Africa, who had landed safely only a few yards away, had his borrowed Weihe blown over and wrecked before he could be helped. Many crews were still struggling in heavy rain in the mountains when dusk fell.

Friday, July 4th, 1952

The day was declared a rest day, and pilots were arriving back all day from yesterday's stormy flights. They brought fantastic stories of the weather they had met in trying to cross the mountains. Jock Forbes, who succeeded and reached the plain near Zaragoza, found a light SSE. wind as far as the hills and got across at about 8,000ft, although the sky had clouded over.

Paul McCready's Schweizer 1-23 (U.S.A.). McCready gained second place in the 1950 world championships.

Dick Johnson (check shirt), holder of the world distance record for gliders, talks with Capt. Ralph Barnaby, U.S.N., and Earl Bailey.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TOTAL NUMBER OF AIRCRAFT
2500 N. Miles
RADIUS OF OPERATION—N. MILES

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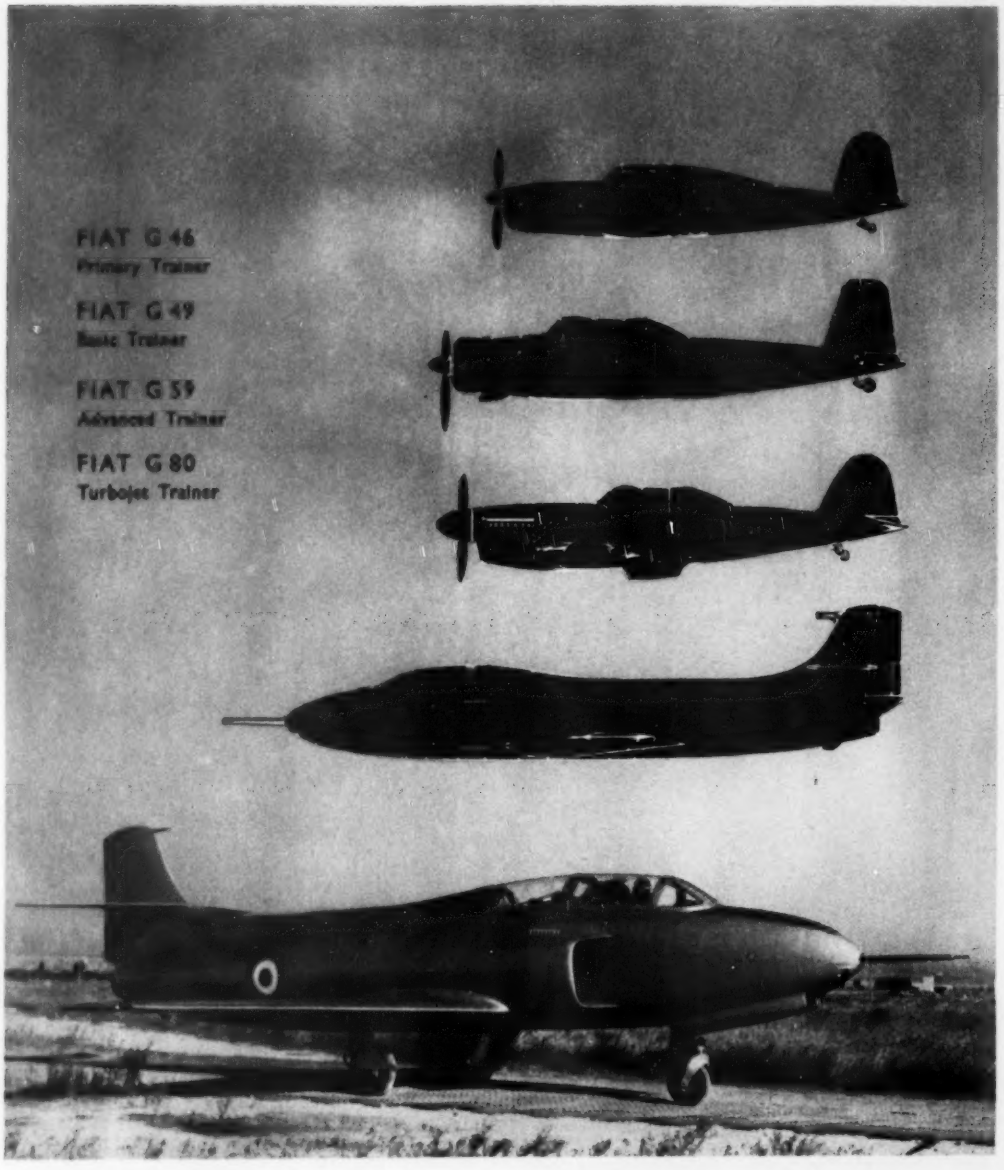

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WORLD GLIDING CHAMPIONSHIPS . . .

Immediately the plain was reached the wind swept round to N.W. and Forbes was unable to progress against it: he reckons that it reached 60 kt. He was forced to land in this gale and, incautiously circling an airfield, was swept away and forced down in a field. Here he stayed in his cockpit, his air-speed indicator reading 30 kt, for half an hour until his trailer crew arrived to secure the sailplane.

Lorne Welch, who followed the same route as Forbes, did very well up to the mountains, reaching 15,500ft in cloud, but did not feel that he had enough height when he reached them to venture across the broken, "canyon" country. He landed after 120 miles in the still light wind and watched some twenty other gliders pass overhead. His crew was with him one hour after his landing. Kamil (Egypt), Nilsson (Sweden) and Hanna Reitsch (Germany) all landed close by.

The pilots and crews were soaked by 2in of rain during the retrieve, and many pilots were not found until late at night; soaked and shivering, they had an uncomfortable time. This combination of high winds and rough landing country led to several glider casualties. In addition to Lasch (South Africa) and Foster (Great Britain), slight damage was done to Johnson's record-breaking RJ5 (U.S.A.), Ziegler's Mu 13 two-seater (Germany) and Fahrlander's Moswey (Switzerland).

The first day's results were (provisionally) declared as: Single-seaters: 1, Pierre (France); 2, Gehriger (Switzerland); 3, Gildemyn (Belgium); 4, Forbes (Great Britain); 5, Cuadrado (Argentine). Two-seaters: 1, Beuby and Charles (U.S.A.). Pierre flew the vee-tailed Castel-Mauboussin, while both Forbes and Cuadrado were flying the British Sky.

Saturday, July 5th, 1952.

Today was the second contest day, and the task set was a flight to any goal chosen by the pilot from an official list of airfields. The marking system gave most marks to the pilot choosing and reaching the farthest goal, but penalized him seriously for landing short of it, or even for overshooting. Pilots had to assess carefully the best direction to fly and their chances of reaching the various airfields in this direction. Here, the presence of the British meteorologist, Dr. R. S. Scorer, was of great assistance to the team. Wills, Forbes and Stephenson chose Zaragoza, 170 miles to the north-east, while Welch chose Vitoria, 185 miles to the north.

The take-offs began about 1 p.m. in a sky with but a few puffs of cumulus. It was soon evident that thermals were not as strong as on the first day. Several gliders landed back on the airfield to claim a second aero-tow. As the afternoon wore on the cumulus died away and all the gliders left the field.

The four British Skys got away at the first attempt and set off to cross the mountains which had produced the freak weather of the first contest day and had eliminated the unfortunate Frank Foster from the competition. This time conditions were better and Wills and Stephenson arrived close together at their goal, while Forbes landed only 15 miles short. Welch, on the other road, reached Burgos, about two-thirds of the way to his goal. These flights would have been the best of the day but for the little Frenchman, Pierre, who again made the best flight, this time to Leon, 180 miles to the north-west. Ordelman, in the Dutch Sky, also reached his goal at Albacete, 140 miles to the south-east, and it is remarkable that successful flights were made to three of the four quarters of the compass. Only the Americans, who chose to fly to the fourth quarter, i.e., to the south-west, came unstuck.

The leading results for the day were:—Single-seaters: (1) Pierre (France) Castel-Mauboussin, 1,000 points; (2) Wills (G.B.) Sky, 943 points; (3) Stephenson (G.B.) Sky, 943 points; (4) Cuadrado (Argentine) Sky, 776 points; (5) Ordelman (Holland) Sky, 776 points; (6) Forbes (G.B.) Sky 637 points. And in the two-seater class Juez (Spain) Kranich, also reached his goal at Zaragoza and gained the full 1,000 points.

The total points gained in the first two days were, then: Single-seaters: (1) Pierre, 2,000 points; (2) Wills, 1,616; (3) Cuadrado, 1,599; (4) Ordelman, 1,525; (5) Forbes, 1,499; (6) Gildemyn, 1,410; (7) Gehriger, 1,403; (8) Ara, 1375.

The results, so far, were a triumph for the British-designed-Slingsby Sky sailplane, with four of the first seven places. In the two-seater class Juez (Spain, Kranich) led with 1,700 points.

Sunday, July 6th, 1952.

This was again a rest day, and was spent accordingly.

Monday, July 7th, 1952.

Today was the third contest day, and the task was a race to Torre Saviñan, 77 miles to the north-east—once again along the familiar road. The marking system gave marks for speed based on the time taken from the release over the airfield at Madrid to the touch-down at the finish. Another proportion of the marks awarded was for the distance covered, but this award was so small that it was all-important to finish the course.

The sky was cloudless all day and the poor visibility suggested that a stable layer of air low down might inhibit thermals. The launches started at 1345 hr and Forbes was last off according to the ballot. This was no disadvantage, since both landing and take-off were timed, and may have been an advantage in the race since the position of the gliders ahead may indicate the position of thermals along the route.

Several competitors landed back without having found thermals to suit them, but all four British Skys got away well. Their

The British colony of trailers.

trailer crews were already on the other side of Madrid, so that they would be able to keep in radio touch all along the route. The Pye radio set in Mrs. Ann Douglas' Vanguard kept a listening watch on the conversations between the pilots and their ground crews. A discussion between Wills and Welch about which airfield ahead was Torre Saviñan indicated that they were beginning their final dive to the finishing line and, later, Forbes and Stephenson indicated that they, too, had finished the course. It was soon known that 43 of the 51 starters had completed the course and their arrival must have been a wonderful spectacle. (The Spanish organizers made no arrangements for the public to visit the championships and, apart from a few specially invited guests, nobody came or appeared particularly interested in the gliding. Among the special visitors on this day the British contingent were very glad to welcome the British Ambassador, Sir John Balfour and Lady Balfour.)

When the times for the 77 miles were posted up it was seen that three Skys flown by Wills (1 hr 25 min), Forbes and Ordelman (1 hr 30 min) were the fastest. Philip Wills' average speed of about 55 m.p.h. was very fast indeed, since the wind was but light, and it shows that he made full use of the good high-speed performance of the Sky.

The following are the officially promulgated results of the race:

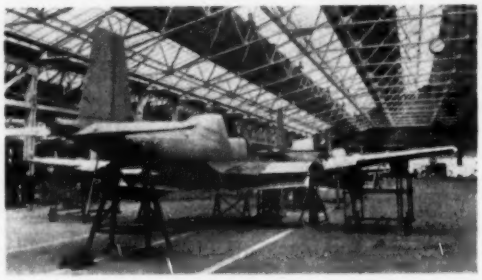
(*Concluded on page 76*)

The tailless Horten XV (Argentine).

Gerard Pierre's Castel-Mauboussin sailplane.

THE NEW COLLEGE

Boulton Paul Balliol Production gets Under Way at Wolverhampton



Initial erection takes place with the fuselage trestled across the assembly-line (above), although the Balliols are turned through 90 deg before final erection (right). The production Balliol is fitted with neat, and effective, air brakes (left). Pneumatically operated, they should facilitate dive-attack practice.

"Flight" photographs

THE gradual exodus of the Harvard from the Royal Air Force will be viewed with regret by the vast body of pilots who were trained on the type. But nostalgia will be mixed with expectancy for those lucky enough to be on the receiving end of the Boulton Paul assembly lines at Wolverhampton, where the Balliol T.2 is being steadily produced against a rewardingly large order.

The Balliol was originally designed as a turbine-powered, three-seat trainer and two prototypes were built in this form. The Mamba was the engine selected, although, as the first airframe was ready well in advance of the first Mamba, a Bristol Mercury 25 was fitted for the first flight in May 1947. This aircraft, known as the P.108, was the subject of an "In the Air Series" article in *Flight* of June 24th, 1948. Wisely, the production order was for a Rolls-Royce Merlin-powered aircraft but with two seats.

A pre-production batch of T.2 aircraft was delivered in 1949 and 1950 for extensive testing at various Service establishments. One of these aircraft went to the U.S.A. in 1950 for evaluation against contemporary American trainers. Another was fitted with an arrester hook and long-stroke undercarriage legs for carrier trials, which were successfully completed aboard H.M.S. *Illustrious*. All Balliols, by the way, have folding wings.

Present output, which is well advanced at both Boulton Paul Aircraft, Ltd., and at the Brough factory of Blackburn and General Aircraft, Ltd., is for the Flying Training Command of the R.A.F. (T.2) and for Naval Aviation (Sea Balliol T.21).

Pneumatics are employed throughout the aircraft, a 1,000 lb/sq in system being used for undercarriage, flaps and air brakes. Great attention has been paid to accessibility, and the interchangeability between, for example, the port and starboard undercarriage units and ailerons is evidence of the consideration which the "B.P." design team have accorded to the user's requirements.

The engines fitted were originally built as Merlin 24s some years ago, since which time they have been carefully stored. For Balliol installation they are modified up to Merlin 35 standard in order to give reliable service over a longer working life with increased overhaul time. The engines are, of course, in no way "second-hand"; they have not previously been installed in airframes and have zero hours.

Very complete equipment is carried by the Balliol, including full two-stage amber day-night; comprehensive radio; a fixed Browning 0.303in gun in the port outer wing; shackles for the attachment of under-wing bomb-carriers or tanks; and many cockpit amenities, including heating, ventilation and an electrically-sliding hood. The aircraft will be used for all forms of fighter training, and can also be used for photography, and for glider- and target-towing. Boulton Paul aircraft have long been renowned for their tractability in the air; the Balliol is no exception and should prove deservedly popular on this score.

WORLD GLIDING CHAMPIONSHIPS

Continued from page 75

Single-seaters : (1) Wills (G.B.) Sky, 1,000 points; (2) McReady (U.S.A.) 1-23, 974; (3) Forbes (G.B.) Sky, 893; (4) Ordelman (Holl.) Sky, 890. Pierre, the leader to date, took 1 hr 50 min and scored 624 points. Two-seaters : (1) Frowein (Germany) Kranich III, 1 hr 46 min; Juez, the leader in this class, took 1 hr 54 min.

Leaders after three contest days :—Single-seaters : (1) Pierre (France) C.M., 2,624; (2) Wills (G.B.) Sky, 2,616; (3) Ordelman (Holland) Sky, 2,415; (4) Forbes (G.B.) Sky, 2,392; (5) Cuadrado (Argentine) Sky, 2,265; (6) Gehriger (Switzerland) Weihe, 2,140; (7) Ara (Spain) Weihe, 1,963; (8) McCready (U.S.A.) 1-23, 1,904; (9) Stephenson (G.B.) Sky, 1,893. Welch lay 13th. In the two-seater class : (1) Juez (Spain) Kranich, 2,617; (2) Beuby (U.S.A.) Kranich, 2,124; (3) Rasmussen (Denmark) Kranich, 2,101; (4) Hanna Reitsch (Germany) Kranich III, 2,024.

Great Britain has every reason to be proud of the results so far. There will probably be three more competition days before the contest closes on Saturday, July 12th, but there is no sign yet of the challenge that was expected to come from the previous winners, Sweden and Germany, or from the powerful American team.

Tuesday, 8th July, 1952.

The retrieves after the race yesterday had been fairly short and competitors were ready for another contest day. Briefing and preparations went on as usual, but, after all gliders had been rigged and towed to the starting line, the organizers announced that there would be no contest. Three gliders, which were already airborne and were reporting good thermals, were recalled by radio and pilots and crews adjourned to the swimming pool. The weather was apparently judged unsuitable for cross-country flying. It was fine and hot, with only one-eighth of high stratus cloud, but an inversion might have limited thermals to a few thousand feet. In these conditions the British team would have been at home, so there was some disappointment.

The keen struggle for the lead between Wills and Pierre is adding to the excitement of the championships. Philip Wills, now in his middle forties, has competed in international gliding meetings for fifteen years and has many times won the British National Championships. In contrast, the young Frenchman, Gérard Pierre, who is only nineteen years old, has packed his gliding experience into three years. His father, a wealthy Paris butcher, is reputed to have offered his son the career of his choice and Gérard chose gliding. As a full-time amateur he has been able to amass a prodigious time in the air and in three years is already in the front rank.

Wills, who has flown a pre-war German Weihe sailplane for many years, is already at home in the new blue Slingsby Sky, while Pierre is flying the little Castel-Mauboussin. His glider is cream with red registration letters, and has some interesting technical features, notably a "butterfly" tail and petal-shaped lift spoilers on the wings.

Mr. F. N. Slingsby, who has arrived in Madrid, must be extremely proud of the performance of the Sky so far. Although the cruel weather conditions robbed us of one on the first day, the remaining seven lie in the first thirteen places.

(*To be continued*)

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The Avro Shackleton, the submarine's worst enemy, can truly be described as a convoy's best friend. For this great aircraft carries the finest radar equipment for submarine detection. It can press home a heavy attack with depth charges and bombs against underwater or surfaced enemies. It can sweep many thousands of square miles on extended, long-range patrols. With 4 Rolls Royce Griffon engines giving supreme reliability, the Avro Shackleton is now in full squadron service with Coastal Command.

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Southern Forge Extrusions were used in the construction of the Midland Electricity Board's Exhibition Stand at the recent Royal Show. It will be seen that the designer took full advantage of the unique characteristics of aluminium alloys — lightness, strength and weather resistance — in this structure built by SMD of Slough.

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CORRESPONDENCE

The Editor of "Flight" does not hold himself responsible for the views expressed by correspondents in these columns; the names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

A Coronation Review

WOULD it not be appropriate next year for this country to stage a large-scale display by the Royal Air Force, as a tribute to the Coronation of our Queen? Undoubtedly, the R.A.F. Display of 1950 was one of the best post-war shows ever presented to the public, and I am sure that something along these lines would not only mark the celebration of a great occasion, but would be an added attraction to the many overseas visitors who will no doubt be in Great Britain at the time.

Representative aircraft and crews from the Commonwealth, Colonial and N.A.T.O. Air Forces could be invited to take part. Farnborough would seem to be the best venue as it can accommodate an exceptionally large crowd, but seating and refreshment facilities of a good standard would be needed, and traffic and spectator control would have to be better than at past S.B.A.C. Displays. However, if plans are laid now, this could be a memorable show.

One hopes that the Air Council will be able to arrange a display for which I beg the liberty to put forward a title: "The Royal Air Force Coronation Review."

Birmingham. PETER F. WRIGHT.

Abolish the Barrack Square?

MAY I trouble you with a few points prompted by one of your correspondents, *Flight*, July 4th, page 28. In the letter headed "Seen at Gib." it is stated that our R.N. aircraft are "mostly in an indifferent state of servicing." While bearing in mind that many of our machines are of the obsolescent variety, such a sad state of affairs may lead to some of us pondering its significance, and also wondering whether it is limited to naval aircraft.

Is the reason—or part of it—to be found in the shortage of tools and equipment, together with skilled tradesmen in the service; and is this coupled with indifference towards the job by those responsible? We all frequently hear much argument and criticism raised about our Services and their methods and equipment, and we also know that it is all too easy to find fault and criticise rather than find the cause of the setbacks. But there are, nevertheless, a few matters concerned with this vital business of air power which often appear to be overlooked or underestimated in many quarters.

It should be quite obvious to anyone who has seriously studied the contents and editorials of *Flight* and other leading aircraft publications that there has been something radically wrong and cock-eyed about part of our Service organization for some time. This will, no doubt, be even more significant to anyone who has also studied the working of the usual Service machinery. It seems quite evident that, in many cases, far greater importance is attached to all manner of out-dated and out-moded methods of "ceremonial mumbo-jumbo" than to the all-important and vital matter of flying and servicing aircraft and equipment.

It is high time that it was firmly understood by all concerned that the real job of maintaining technical efficiency, whether in the air, at sea, or on the ground, is now quite incompatible with the old ideas of the barrack square variety in "brass and blanco!" Such things may look all very nice—in their proper place—but should not be allowed to interfere with the technical working of the Services, as is usually the case.

How is it possible for men to concentrate on their job of flying and servicing aircraft and other vital equipment of the Services if their efforts are largely frustrated by a frequent round of drill, parades, and various other queer tasks, which seem to have little connection with the well-being of the Service and country? It really is somewhat pathetic and tragic that, in this "atomic age" of jets and supersonics, we should still be bound by the relic of the quaint phenomena which masquerades as discipline; and is more frequently known as traditional "bull."

There should be no excuse for bad organization and servicing of our aircraft, and it is no use always "passing the buck," or blaming the tradesmen; neither is it a question of "mere pay, new hats, and nylons!" The real reasons for any shortages of manpower, or lack of interest in the Services, are largely due to the fact that there is far too much interference in the technical side by the administration of petty nonsense, by certain people who often decide to run their own Service—and get away with it! They would do well to ponder over the fact that "atomic bombs" are no respecters of such, whether aship or ashore.

Croydon. CHARLES B. LUCE.

Asymmetric Power

I AM collecting material for a book on the subject of "Flight on Asymmetric Power." If any readers can help me with the following information I would be extremely grateful:—

1. The earliest known case of a successful single-engined landing following engine failure.
2. Readers' own accounts of episodes of this kind during war-time and peace-time.
3. Details of an American aircraft which recently completed a flight with one airscrew removed.
4. Details of the German asymmetric aircraft which was built during the war.

Inverness. G. WRIGHT.

Security-minded Enthusiasts

I FEEL I must make another brief intrusion into your columns following the publication of my letter in your issue of July 4th, and the appended editorial comment.

To dispel any possible misunderstanding of your comments I can assure you that Air Britain is fully "security-minded," and is governed by precisely the same regulations as your own journal. Our publications are carefully vetted, and if doubt exists we seek advice from the appropriate Ministry or Service department. We receive much assistance from these authorities and have naturally no desire to abuse their kindness. Neither have we any desire to appear at Bow Street!

Incidentally, only a small amount of our work is subject to security regulations, as so much more is devoted to civil aviation, or military aviation of a "pre-security" era.

Acton. D. K. FOX,
Chairman, Air Britain.

FORTHCOMING EVENTS

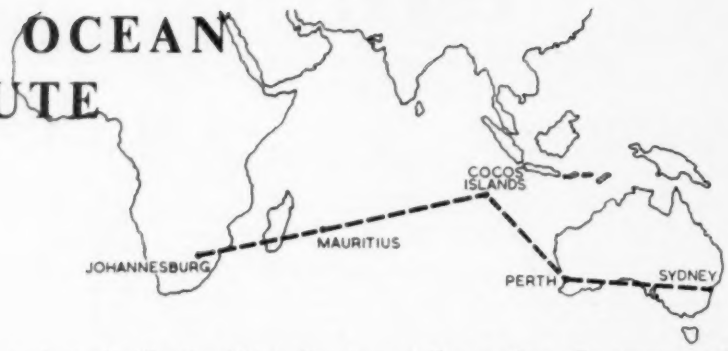
July 19. Leicestershire Aero Club: Rally, Leicester East.
July 20-27. Aero-Club d'Italia: International Air Week, Italy.
July 26. Royal Engineers' Flying Club: Air Day, Rochester.
July 27. R.A.F. Golfing Society: Match v 2nd T.A.F., Bad Eilsen.
Aug. 2. "Daily Express" Challenge Trophy Race.
Aug. 2-3. "ILSY" Air Display, Ypenburg.
Aug. 3-4. S.M.A.E.: National Model Aircraft Rally. R.N. Air Station, Gosport.
Aug. 9-10. Skegness Airport: Display.
Aug. 13-17. Nordic A/2 Models Contest. Austria.
Aug. 15. Aéro-Club de Charente Maritime: Laleu and La Rochelle Air Meeting.
Aug. 15. Ailes Montluconnaises: Rally.
Aug. 16. Aéro-Club de Vendée: Sables d'Olonne Rally.
Aug. 16-17. Bembridge and Sandown Aero Club: Rally.
Aug. 23. Coventry Aeroplane Club: Air Day and Siddeley Challenge Trophy Race.
Aug. 23-24. Aéro-Club de Trente: Dolomites Circuit.
Aug. 30. Midland Aero Club: Display.
Aug. 30-31. U.S. National Air Races.
Aug. 31. A.B.A.C.: Summer Convention.
Aug. 31. S.M.A.E.: British Model Championships, College of Aeronautics, Cranfield.
Aug. 31-Sept. 7. Scandinavian Air Rally.
Sept. 1-7. S.B.A.C.: Flying Display and Exhibition, Farnborough.
Sept. 7. "Yorkshire Evening News" Model Flying Festival, Sherburn-in-Elmet.
Sept. 15. Battle of Britain Day.
Sept. 15. I.A.T.A.: Eighth Annual General Meeting, Germany.
Sept. 17. Golf: R.N. and W.R.N.S. v. R.A.F. and W.R.A.F., Camberley.
Sept. 20. R.A.F. At Home Day.
Sept. 21. S.M.A.E.: Models Contests, Butlin's Holiday Camps.
Sept. 28. Aéro-Club de France: Coupe Stemm Helicopter Competition.

ARMAMENT INTELLIGENCE

"Weapons," Vol. I—"Overture to Aggression"; Vol. II—"Red Sky," by Roger Marsh. Weapons Inc., Hudson, Ohio. Price $2 per set.

THE gun-cranks will coo with delight on beholding these two slim volumes of sketches and notes concerning Russian pistols, rifles, machine pistols, grenades and automatic weapons of several calibres. Included are the Degtyarev, SchVAK, SchKASS, and the 23 mm gun, known by a variety of names—V-la, Volkov-Yarzev, Volkov-Dzhareev—and concerning which, as Mr. Marsh wistfully observes, "exact data are plentiful, though, unfortunately, these exact data fail to agree among themselves." For such tribulations we have fraternal sympathy, but, in spite of them, Mr. Marsh is to be complimented on a most interesting compilation and a valuable addition to Russian intelligence.

INDIAN OCEAN ROUTE



Qantas to Fly Direct Australia/South Africa Services : Cocos Base Re-constructed

FOR the second time in seven years, the Cocos or Keeling Islands have been transformed from an insignificant coral atoll to an air-base of international importance. The first occasion was in 1945, when the Cocos were found to be the only suitable refuelling point for reinforcement aircraft flying to Australia *via* Ceylon. The base lapsed into disuse after the Japanese collapse, but its strategic importance as a link in Empire air communication had been established, and last year the Australian Government began a £A700,000 reconstruction plan. Qantas Empire Airways, with their vast experience of long-range Indian Ocean flying, had long been anxious to open up a direct route from Australia to South Africa, and this ambition lent commercial significance to the Cocos project. A long new runway of crushed coral is now nearing completion and Qantas will begin its regular service between Sydney and Johannesburg *via* Perth, Cocos and Mauritius on September 1st. Constellation 749As, carrying 38 passengers, will cover the 8,500-mile route in 3½ days.

Situated 12 deg south of the Equator and 530 miles west of Christmas Island, the nearest land, the Cocos are a typical pear-shaped coral atoll consisting of five main islands—Horsburgh, Direction, Home, South and West. Varying in length from one to five miles, the islands surround a lagoon seven miles wide and nine miles long. Fifteen miles away is North Keeling Island, where the wreck of the German cruiser *Emden* marks the scene of Australia's first naval victory.

The discovery of the islands, in 1608-9, is credited to Capt. Keeling of the East India Company. The first settlers, however, in 1827, were John Clunies-Ross and Alexander Hare (who is said to have arrived with "a harem of 100 wives collected from all parts of the world"). As Clunies-Ross built up trade in copra, Hare's companions departed with seamen or transferred to the Clunies-Ross trading establishment, and Hare himself finally abandoned his home on Direction Island. The Clunies-Ross family, which had settled on Home Island, have remained there ever since—in ownership until 1857, when the islands were included in the British Dominions, and thereafter as governors. The first Clunies-Ross imported native labour to work on coconut plantations, providing them in return with food, clothing and other necessities—a benevolent autocracy which, by all accounts, anticipated modern systems of social security by 100 years and has been operated with success ever since.

The quiet pattern of island existence was broken in 1945 when R.A.F. construction parties arrived to build an airstrip on West, the largest island. Work began on April 7th, and by May 28th some 2,000 yd of P.S.P. runway had been laid on a 2,500 yd strip of cleared jungle. Full flying control facilities, radar and radio had also been installed. The runway, when completed, extended the full length of 2,500 yd (by 50 yd wide), and there was sufficient taxi-track area for the parking of 100 heavy aircraft. Though designed to handle 500 aircraft monthly, this number was reduced to 200 with a change of Allied fortunes in the Far East.

Home Island, one of the five which make up the Cocos group, as seen from a Qantas Skymaster carrying supplies and mail to the R.A.A.F. construction party. The picture is by Qantas navigator J. Cowan.

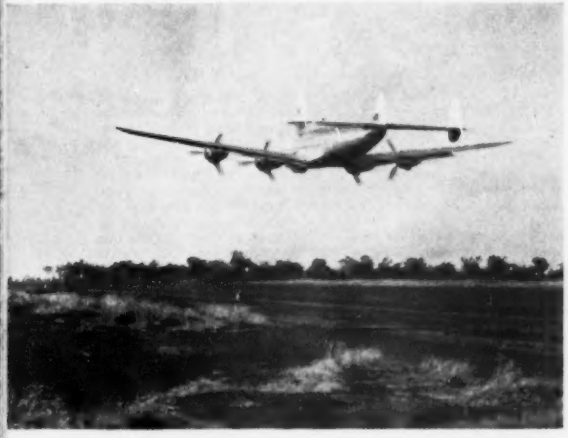
From the outset, a Spitfire squadron had been based on the island to protect it from possible Japanese attack. It was to have been supplemented, in mid-1945, by four heavy-bomber squadrons, one long-range reconnaissance squadron, a P.R.U. flight, a flying-boat squadron and an A.S.R. unit. These forces began to arrive in July 1945 and preparations were made for large-scale attacks on the Japanese, but the surrender came in August. In fact, the main task of the Cocos base came after the war, when it was used by transports carrying liberated prisoners-of-war. By the beginning of 1946 most of the movable equipment had been taken away from West Island, and, although the airstrip and control tower (bearing the inscription "Cocos 3ft"—its height above sea-level) remained, most of the expensive wartime construction work had been undone.

Not until November 1948 was the airstrip used again. The occasion was the first direct flight between Australia and South Africa, made by an Avro Lancastrian of Qantas, flown by Capt. L. R. Ambrose, who is to be the airline's new London manager. The flight began on November 15th and was made *via* Perth, Cocos and Mauritius and the aircraft arrived at Johannesburg on November 27th. The log of Nav./Off. J. Cowan records average speeds of just over 200 kt and heights varying from 7,000 to 11,000ft. Distances

and times for the four legs of the outward journey were recorded as follows: Sydney-Perth, 1,787 n.m., 10 hr 21 min; Perth-Cocos, 1,627 n.m., 8 hr 5 min; Cocos-Mauritius, 2,231 n.m., 12 hr 8 min; Mauritius-Palmietfontein, 1,766 n.m., 9 hr 40 min. Wind components for these four stages were, respectively, −33 kt, −1 kt, +9 kt, −6 kt. The Lancastrian left Johannesburg on November 27th and was back in Sydney by December 1st.

For some 300 days of the year, gentle south-east trade winds blow across the Cocos and the airstrip lies into wind practically the whole time. Average temperature on the island is 81 deg F, and the rainfall is 77in., most of which, of course, falls during the monsoon season. On the whole, weather hazards are slight and although there is a chance of occasional cyclones, these are well plotted. Aircraft flying to the Cocos will carry a fuel reserve for "island holding" instead of "to alternate."

The survey flight proved that a direct Australia-Africa service was practical if the neglected and overgrown Cocos airstrip could be reconstructed. The Australian Government was ready to exploit both the commercial and strategical possibilities of the base but some administrative difficulties had first to be overcome. The main problem was solved last year when the British Government handed over to Australia the administration of the islands, which had previously been undertaken from Singapore. It was stipulated that the native population should have the opportunity of becoming Australian citizens, that the Clunies-Ross family should retain their traditional ownership of the property and that British aircraft would be allowed to use the base. Australia also acquired the responsibility of compensating the Cocos rulers for the loss of 21,900 coconut trees cut down when the wartime airstrip was built. The value of the trees was estimated as £87,600.



Pictured on take-off is VH-EAD "Charles Kingsford-Smith," a Constellation 749A of the type to be used by Qantas, in 38-seat form, on the Indian Ocean service, scheduled to begin in September.

In May, 1951, representatives of the Australian Department of Civil Aviation, the R.A.A.F., Q.E.A. and the Australian Navy left Sydney in a Qantas Catalina to survey the task of setting up a new Cocos airport.

On arrival, it is reported, they found much evidence of the R.A.F. occupation . . . "at the end of the 7,500ft P.S.P. strip stood a remarkably well preserved Liberator. There were two hard sandy areas made of bitumized hessian spread over coral sand and an excellent three-storey concrete control tower. . . . The survey party was shown a deserted church, St. Christopher's, and several tablets erected to the memory of aircrew who lost their lives whilst serving in the area.

"Motor vehicles, mechanical equipment, two mobile laundries, piping, petrol drums and a two-foot gauge railway line from the jetty were all being overgrown by tropical undergrowth and corroded by the weather. Most of the motor vehicles had been stripped of carburettors, spark plugs, etc., and did not seem capable of economic repair. Most important were 47 buildings still standing and, in spite of five years of neglect and exposure, some of these could be reconditioned and used again. The survey party reported that fuel tanks near the strip, capable of holding 700,000 gallons, were in good condition.

"The party received the greatest help from all inhabitants of the island. Each morning native boys sailed their locally made dugongs across the lagoon, worked intelligently and well all day long, then sailed back home again. Motor trucks, launches and other equipment were lent and medical assistance was given when some of the members of the party were bitten by six-inch centipedes, which are common on the island. . . ."

After the survey no time was lost in forming a 400-man R.A.A.F. construction party under G/C. W. A. C. Dale, D.S.O., to begin the £A700,000 task of turning Cocos into a modern airport. A small village of prefabricated homes was erected to house this party with additional dwellings for employees of the Government, Qantas, and the Shell Oil Company. Electrical generating equipment, radio navigation aids, airport lighting, a telephone exchange, workshops and a marine base for rescue launches have all now been installed on West Island. The construction squadron, whose numbers have now reached 500, have also nearly completed the single runway, 8,000ft long by 150ft wide and built of crushed coral. Although this material is strong enough to take Constellations and Stratocruisers it has been found necessary at Labuan, where there is a similar runway, to flood the crushed coral periodically with sea water to prevent it from disintegrating. Although Qantas have not flown the Sydney-Johannesburg route since 1948, they have built up considerable experience since last January of conditions on the Perth-Cocos leg with fortnightly courier services by Lancastrians and DC-4s. The first proving flight by a Constellation is scheduled to begin next Friday, July 25th, arriving at Johannesburg on the following Monday.

Initially, services will be fortnightly, with the inaugural flight on September 1st and the first return journey from Johannesburg on September 4th. Fares will be £A275 single and £A495 return. The elapsed time of 3½ days will cut by four days the present air route between Australia *via* Singapore and Cairo. Fairly intensive flying will be involved on the over-ocean section of the route. After taking off from Perth the Constellations will reach Cocos in approximately 8¼ hr flying time, spend about 3 hr on the ground at the island base and then take off for the 12 hr 5 min flight to Mauritius, where there is a night stop. The final leg to Johannesburg will be flown in just over 8 hr.

Flashback to 1945, when the newly completed Cocos base was expected to take an important part in the Japanese war. The Spitfires shown on the P.S.P. runway were stationed there as insurance against air attack.

CIVIL AVIATION

SAFETY IN THE STATES

THE National Safety Council of America has named no fewer than 42 scheduled U.S. flag airlines as winners of its safety award for 1951. All operations covered are domestic flights in the U.S.A. and Alaska. Fifteen of the carriers are trunk and international carriers, 10 are territorial airlines, 16 are feeder-line operators and one is a scheduled cruise line. All qualified for the award in one of the three following ways: completing the calendar year 1951 without passenger or crew fatality; flying 2,000,000,000 or more consecutive passenger-miles without fatality even though an accident terminated its safety record in 1951; completed five or more consecutive years of safe operation even though a fatality terminated its record in 1951.

Twenty-eight of the companies had had no fatal accident since they began operations, in some cases as early as 1930. The greatest amount of fatality-free operations by any airline was 4,675,379,000 passenger-miles. The passenger-fatality rate for U.S. domestic operations during 1951 was 1.3 per 100,000,000 passenger miles. This was slightly higher than the rate of 1.1 for 1950. In the year covered by these awards there was an average of 12,464 daily take-offs and landings and the percentage of fatal crashes in total daily operations was roughly .0001 per cent.

UNIVERSAL AIR-TRAVEL CREDIT

NEARLY half a million airline customers are using the "charge it" system of the Universal Air Travel Plan to buy travel over the routes of 71 of the world's certificated airlines. The plan is sponsored jointly by I.A.T.A. and the Air Traffic Conference of the Air Transport Association of America, and is administered by C. C. Hubbard of the latter organization.

More than 38,000 new cards have been issued during the past year to enable more travellers to take advantage of the only world-wide credit plan now in operation by the air-transport industry.

Under the plan, the traveller is able to secure a credit card honoured by all of the 71 A.T.A. and I.A.T.A. member-airlines flying domestic and international routes. In addition, the credit cards are honoured by a large number of hotels in the United States who are members of the American Hotel Association, as well as by automobile rental services.

Of the total of 476,921 airline credit cards now in use, 345,944 have been issued for transport within North America and 130,877 for world-wide international transport, 80 have been issued for use in connection with controlled currencies, and 20 for use in Germany.

HEAVYWEIGHT: Unusual aspect of the S.E.2010 Armagnac, which, with a wing-span of 160ft 7in and a gross weight of some 165,000 lb, is the largest civil transport aircraft in airline service—in this case with T.A.I. (Cie de Transports Aeriens Intercontinentaux). Power-units are four 3,500 h.p. Wasp Majors and up to 107 seats can be fitted.

CO-ORDINATING MEDITERRANEAN TRAFFIC

AN I.C.A.O. announcement states that an investigation will be made into the possibility of I.C.A.O. direction of an air-traffic co-ordination centre in the Eastern Mediterranean flight information region. At present no single unit exists in the region for the provision of flight-information services.

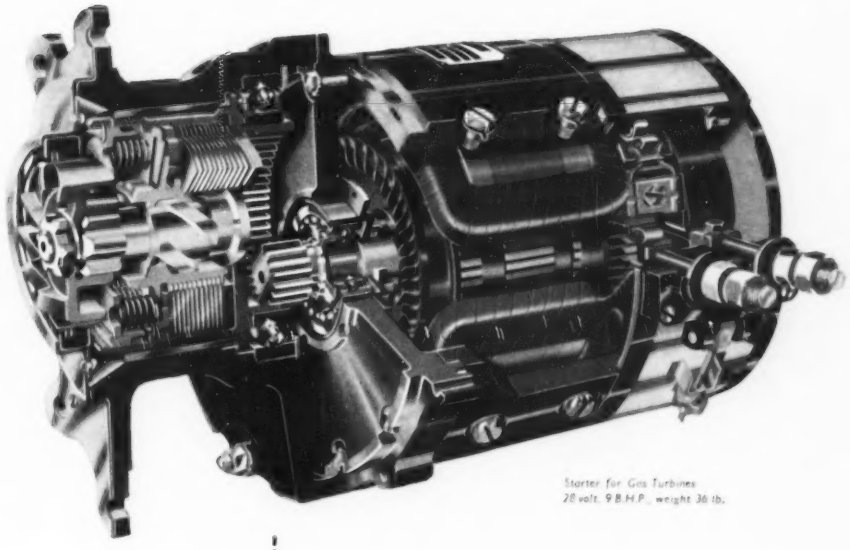
Present procedures permit an aircraft in the region to obtain flight-information services from Beyrouth (Lebanon), Cairo (Egypt) or Lydda (Israel) as the pilot may choose. This does not prove satisfactory as, for non-technical reasons, there is no exchange of information between Beyrouth or Cairo on the one hand and Lydda on the other. Consequently, none of the centres has knowledge of all aircraft movements in the region and cannot supply an aircraft with reliable information on the location of other aircraft in its vicinity. There is also no exchange of important meteorological information. The purpose of the proposed co-ordinating facility is to receive information affecting the safety of aircraft in the region and to ensure that this information is passed on to all units needing it.

The action taken by the I.C.A.O. Council was the result of recommendation made by its Air Navigation Commission, which has also instructed the Secretariat to prepare, in collaboration with the states concerned, a plan covering the establishment, staffing and operation of the proposed facility. It is based upon a proposal adopted at an I.C.A.O. Regional Air Navigation meeting held in Paris this spring. This recommendation asked that the

FREIGHTERS OF A.N.A.—the company operates three—are used mainly in connection with the famous Air Beef scheme. The prize shorthorns on the left, however, have been led aboard the Freighter for carriage to a Brisbane cattle show, instead of a slaughter station. The aircraft are also in demand for transporting horses to inter-state race meetings, as illustrated on the right.

The Electrical Aspect...

INCREASED PAYLOAD, HIGHER UTILISATION



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28 volt, 9 B.H.P., weight 36 lb.

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* Overspeed limitation.
* First gas turbine starter to embody torque limitation.
* Operating from a constant voltage of 28.
* Simplified control.

These design features give a high power to weight ratio and increase unit serviceability—two important factors which have contributed to the successful operation of the De Havilland "Comet." This is yet another example of Rotax development helping the aircraft designer to attain greater payloads.

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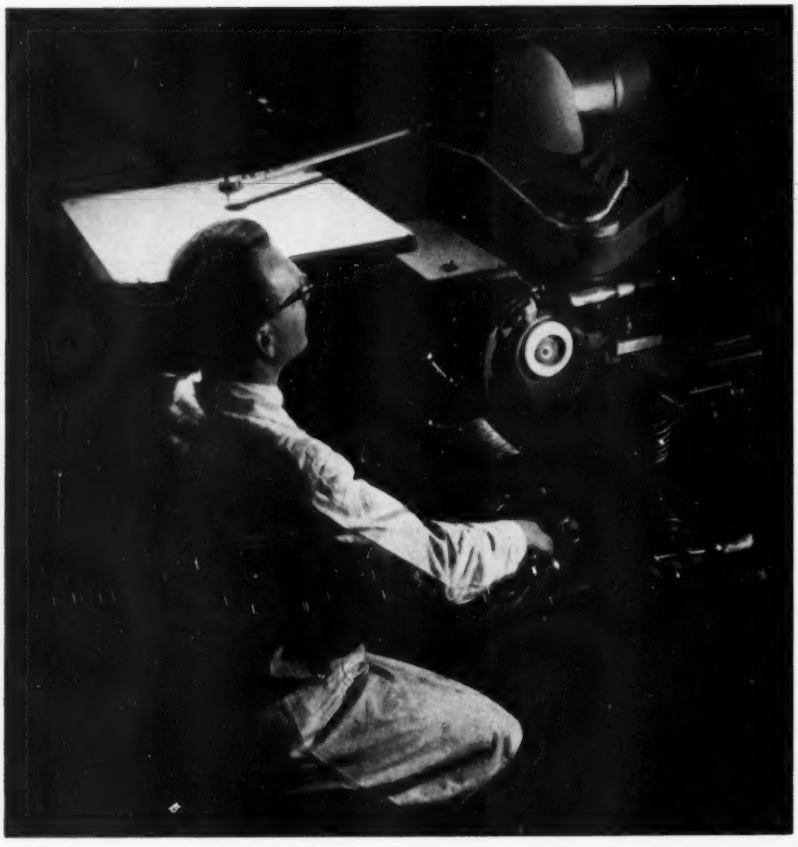

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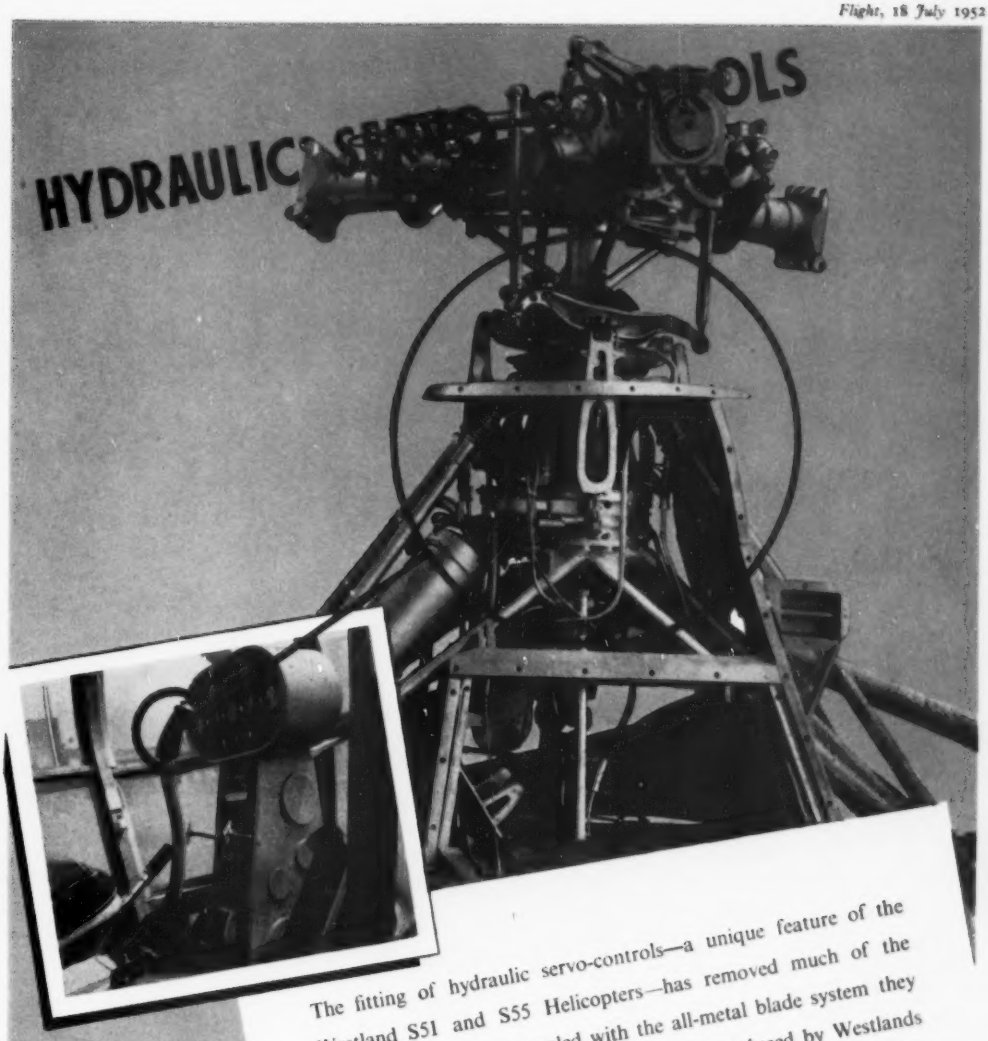
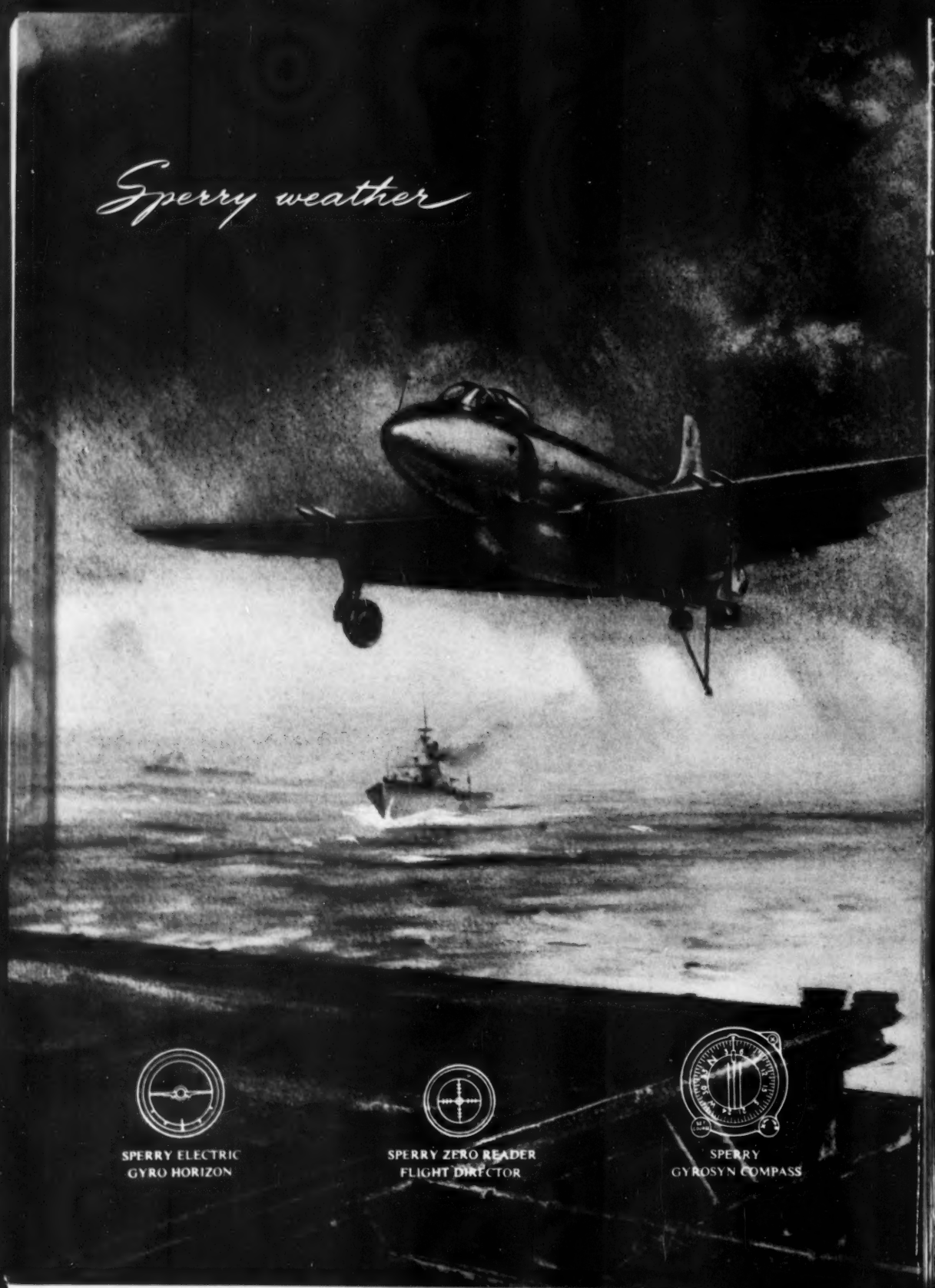


The fitting of hydraulic servo-controls—a unique feature of the Westland S51 and S55 Helicopters—has removed much of the tedium of pilotage. Coupled with the all-metal blade system they are but typical of the technical advances introduced by Westlands in the S51 and S55 Helicopters which now have well over half a million operational hours to their credit.

WESTLAND S·51 & S·55


Sperry weather
SPERRY ELECTRIC
GYRO HORIZON
SPERRY ZERO READER
FLIGHT DIRECTOR
SPERRY
GYROSYN COMPASS

CIVIL AVIATION . . .

Council "intensify its efforts to develop a more satisfactory solution to the air traffic services problems now existing in the region, envisaging that the implementation of a solution may require the Organization to assume direct operating responsibilities in agreement with the states concerned."

NEWS OF THE COMETS

COMETS in service with B.O.A.C. have now logged 2,865 hours' flying, of which over 800 have been flown on regular London-Johannesburg services. Six of the de Havilland jet airliners have now been delivered to B.O.A.C. and a seventh is due shortly; the Corporation will take delivery of a total of nine Ghost-powered Comets, the remaining eleven on order being Series II machines with Avons.

The first part of an important new proving flight was completed on July 8th, when a Comet, piloted by Capt. A. M. Majendie, arrived at Haneda Airport, Tokyo, 27 hours 22 minutes' flying time after leaving London. Its visit evoked tremendous enthusiasm, and the crew were presented with large bouquets of flowers. Capt. Majendie said on arrival that he had "dawdled" along the 10,040-mile route at an average speed of 380 m.p.h.; *en route* facilities were adequate for the regular London-Tokyo Comet service, due to begin early next year.

MORE SUPER-CONNIE ORDERS

NEW orders are announced for five more Lockheed Super Constellations—three for K.L.M. (who have already ordered ten) and two for Air-India International, Ltd. The Dutch airline, which stresses that the order is financed out of its own resources, need the extra aircraft to carry a growing number of emigrants to Australia, New Zealand and Canada. It expects delivery of the extra L.1049 Constellations during the first half of 1954. Mr. J. R. D. Tata, chairman of Air-India International, is quoted as saying that delivery dates would have made it impossible for his company to operate Avon-Comets before the end of 1955, and that it could not afford the business risks involved in continuing operation until then with unchanged types of aircraft.

A COMMON COURSE

NAVIGATORS of 12 airlines assembled in London last week for the annual convention of I.A.N.C.—the International Airline Navigators' Council. This was the council's third convention and the first to be held in London; Mr. John D. Nicholas, of T.W.A., was in the chair. From the secretary, Mr. R. J. Wainwright, of B.O.A.C., we learned that I.A.N.C. is hopeful of achieving representation on I.C.A.O.—a step which would greatly assist the organization in its stated intention to "encourage the interests of the air navigation profession, promote safety in the air, work for the development of a strong aviation industry, exchange technical information and adopt uniform and specific requirements with respect to the licensing and use of air navigators."

An important contribution to the interchange of professional information came from S.A.S. navigator Einar Pedersen, who outlined his company's plans for using the Northern route—a possibility opened up by completion of new airfields in Greenland and Norway. This route would give an estimated saving of ten hours on the present 28-hr flight-time between Stockholm and Seattle *via* New York. S.A.S. believe that they could also operate between Stockholm and Tokyo (*via* Bodo, Thule, Anchorage and Shemya) in 30 hr 15 min total flying-time. Initially the Polar route would be used only for delivery or charter flights, but Mr. Pedersen was convinced that regular services would eventually be safe and economical.

Papers were also read at the convention on "single heading" pressure-pattern flying on the North Atlantic route, as practised by T.C.A., and on the problems of navigation in jet airliners, and recommendations on meteorological procedures were agreed on by delegates.

OLYMPIC AIRLIFT

SOME 20 flights are being made to Helsinki by Avro Yorks of Lancashire Aircraft Corporation, who have been commissioned to carry some 300 competitors, with horses and equipment, to the 1952 Olympic Games. Lancashire will carry the entire British contingent and the Canadian horse-team; four of the flights will carry British horses and two will transport Canadian mounts. The Yorks have been modified to carry five horses each in individual boxes.

The carriage of animals by air has been the subject of an increasing number of recent news-items. During the first six months of the year, Silver City Freighters carried 233 racehorses, and the same company has announced charters for 21 aircraft-loads of homing pigeons. K.L.M. recently carried their 100th horse across the Atlantic.

AIRLINER PRODUCTION PROSPECTS

VISCOUNT SWINTON, Chancellor of the Duchy of Lancaster, struck an optimistic note when discussing the production-programme of new British airliners in the House of Lords last week. The Comet, he said, "has such a reputation that we may not only get the orders that the airlines want to place, but we may have collared the market for generations." After stating that the new Short and Harland assembly line would double the present output of Comets, Lord Swinton said that production of the Viscount was being reorganized, and sub-contracting extended, to double also the proposed output of these turboprop airliners.

NEW FUEL TANKS AT SCHIPHOL

NEW fuelling installations have been brought into service at Schiphol—the municipal airport of Amsterdam and main base of K.L.M.—to meet an average daily demand for 37,400 gallons. There are 32 tanks, capable of containing 200,000 gallons for the Dutch Shell Company and a further 130,000 for Esso. Fuels and oils are supplied mainly by lighters *via* a navigable canal alongside the airport, and pumped into storage tanks by underground pipes fitted with an ingenious control enabling all tanks to be run up and checked from a single point.

Thirty refuelling vehicles are in service at Schiphol, with capacities varying from 500 to 3,000 gallons; two fuellers can be filled simultaneously at a rate of 110 gal/min. In 1920, incidentally, the total fuel storage capacity at the airport was 1,320 gallons.

BREVITIES

THERE is to be a public enquiry into the loss of the chartered Avro Consul which was lost in the English Channel on June 14th.

* * *

B.O.A.C.'s North Atlantic services carried 6,207 passengers during May (1,884 of them flew by "Mayflower" or "Beaver" cut-rate services)—an increase of over 29 per cent on the total for May, 1951.

* * *

The total of interline transactions put through the I.A.T.A. Clearing House in May reached the record figure of $18,885,000 (some £6,745,000); the cumulative five-month total of Clearing House transactions was 32 per cent higher than the turnover during the same period of 1951.

* * *

The Scottish Advisory Council is reported to have sent a memo to the M.C.A. recommending that B.E.A. should be permitted to continue its internal-services network in Scotland. Sir Patrick Dollan, chairman of the council, is said to have pointed out that the deficit on the Scottish services is less than the amount paid to David McBrayne, Ltd., for the maintenance of the West Highland steamer service.

* * *

Aden Airways state that their decision to modify four of their fleet of six DC-3s was prompted by the need for flexibility on all their services, no other available and thoroughly proven type of aircraft being so well suited to such mixed classes as the DC-3. Incidentally, the name of Aden Airways managing director is Mr. Richard de Graaff Hunter, and not as quoted in a recent report.

* * *

Implementation of the European airways plan, the outcome of six years' planning, is expected in the near future, following the completion of the fourth special meeting of the Rules of the Air and Air Traffic Services Committee of I.A.C.O.

* * *

Despite currency restrictions, B.E.A. carried 16 per cent more passengers in June than during the same period last year—142,500 compared with 123,000. On domestic services 71,400 were carried—an increase of 26 per cent—and 71,100 flew on international services, 7 per cent more than in June 1951.

* * *

An excellent perspective map of the U.K. National Airways System is now available for instructional and private-study purposes. Copies may be obtained from the accredited chart agents (at 3s 6d, postage extra), Edward Stanford, Ltd., 12/14 Long Acre, London, W.C.2, and Philip, Son and Nephew, Ltd., 7 Whitechapel, Liverpool. Limited quantities are also available on personal application to M.C.A. briefing units at London, Northolt, Manchester and Prestwick.

NATIONAL AIR RACE RESULTS

GROSVENOR CHALLENGE CUP

Pl.	Pilot, Aircraft and Engine	Speed (m.p.h.)	Start order	H'cap time m. s.
1†	D. F. Ogilvy (Club Cadet, Maj. I) ...	106.5	1	—
2†	C. Gregory (Taylorcraft Plus D., Min. I) ...	112.5	6	03 30
3	G. P. K. Donaldson (Globe Swift, Continental)	142.0	15	10 30
4†	B. J. Snook (Tiger Moth, G. Maj. I)	104.0	2	00 20
5*	W. P. I. Fillingham (Chipmunk G. Maj. 10) ...	138.5	14	10 05
6	P. W. E. Heppell (Tiger Moth, G. Maj. I) ...	114.5	9	04 05
7*	C. G. Alington (Comper Swift, Pobjoy) ...	134.0	13	09 30
8	K. C. Millican (Autocrat, C. Min. 2) ...	111.5	8	03 25
9	R. J. D. Hamilton (Moth, Gipsy I) ...	106.0	5	01 30
10*	A. W. Bedford (Whitney Straight, G. Maj. I)	130.5	12	09 05
11	P. B. Cash (Autocrat, C. Min. 2) ...	110.0	7	03 20
12	J. M. Donald (Tiger Moth, G. Maj. I) ...	101.0	3	00 20
13	K. M. Freeman (Moth Minor, G. Min.) ...	116.0	10	05 40
14*	L. S. Loveridge (Hawk Tr. 3, G. Maj. IHC)	138.0	16	11 30
15	R. U. Hummel (Whitney Straight, G. Maj. I)	121.5	11	07 45

N.B.—The Globe Swift, as a foreign aircraft, was ineligible for the King's Cup Race.

KEMSLEY CHALLENGE TROPHY

Pl.	Pilot, Aircraft and Engine	Speed (m.p.h.)	Start order	H'cap time m. s.
1†	P. G. Lawrence (Proctor 1, G. Queen 2) ...	149.5	4	00 50
2†	G. R. I. Parker (Proctor 5, G. Queen 2) ...	146.0	2	00 15
3†	T. G. Knox (Proctor 3, G. Queen 2) ...	150.5	5	01 15
4†	F. Dunkerley (Gemini 1a, 2 C. Min. 2) ...	172.5	8	04 45
5*	J. M. Wilson (Vampire F.9, Goblin 2) ...	445.0	11	19 13
6*	J. N. Somers (Gemini 3, 2 G. Maj. 1c) ...	169.0	7	04 25
7	D. J. Bennett (Proctor 5, G. Queen 2) ...	142.0	1	—
8*	J. de M. Severne (Vega Gull, G. Six 2) ...	154.5	6	02 30
9*	F. Bullen (Hart, Kestrel 16)	171.0	9	05 20
10	G. A. Ferrari (Supersette, G. Queen 70/3) ...	226.0	10	11 17

* Qualified for King's Cup entry on speed basis.
† Qualified for King's Cup entry on handicap basis.

NORTON GRIFFITHS TROPHY

Pl.	Pilot, Aircraft and Engine	Speed (m.p.h.)	Start order	H'cap time m. s.
1†	W. P. Bowles (Messenger 2A, C. Maj. III) ...	132.0	3	01 20
2†	M. R. T. Chandler (Hawk Tr. III, G. Maj. I)	137.5	4	02 50
3†	R. Matthews-Naper (Messenger 2A, C. Maj. III)	124.0	1	—
4†	T. W. Hayhow (Aiglet Trainer, G. Maj. I) ...	135.0	5	03 00
5*	Capt. J. H. Christie (Leopard Moth, G. Maj. I)	123.0	2	00 05
6*	J. Rush (Falcon Six, G. Six I)	161.0	8	08 15
7*	G. C. Marlar (Falcon Six, G. Six)	159.0	7	08 05
8	D. J. Jammett (Hawk Tr. 3, G. Maj. IC) ...	133.5	6	03 10
9*	F. Dunkerley (Mercury 6, C. Maj. III) ...	161.0	9	08 30
10*	R. R. Paine (Hawk Speed Six, G. Six IF) ...	176.5	10	11 00

BRITISH 'AIR RACING CHAMPIONSHIP POINTS

W. P. I. Fillingham	50	T. W. Hayhow	17
C. Gregory	48	P. W. E. Heppell	14
W. P. Bowles	37	C. G. Alington	13
P. G. Lawrence	35	J. de M. Severne	12
G. R. I. Parker	35	K. C. Millican	10
D. F. Ogilvy	31	A. W. Bedford	10
L. S. Loveridge	26	R. J. D. Hamilton	9
F. Dunkerley	25	H. Wood	8
T. G. Knox	25	J. R. Batt	7
G. Marlar	25	P. B. Cash	7
R. R. Paine	24	J. M. Donald	6
J. Rush	22	F. Bullen	6
J. N. Somers	22	D. J. Bennett	6
R. Matthews-Naper	21	D. J. Jammett	5
G. F. K. Donaldson	20	D. C. Jammett	5
M. R. T. Chandler	20	K. M. Freeman	4
J. M. Wilson	19	R. U. Hummel	3
B. J. Snook	19	D. R. Robertson	2
G. A. Farley	18		

THE KING'S CUP

Pl.	Pilot, Aircraft and Engine	Reg.	Start Order	H'cap Time m. s.	Net Lap Times								Finish-Time m. s.	Racing Time m. s.	Average Speed (m.p.h.)	Qualifying Speed (m.p.h.)
					m. s.	m. s.	m. s.	m. s.								
1	C. Gregory (Taylorcraft Plus D, C. Minor 1) ..	HGZ	4	05 25	18 41	17 13	17 07	17 19	75 47	70 22	113.5	112.5
2	G. R. I. Parker (Proctor 5, G. Queen 2) ...	HWR	12	21 35	14 44	13 14	13 18	13 17	76 08	54 33	146	146
3	P. G. Lawrence (Proctor 1, G. Queen 2) ...	HVG	14	22 55	14 20	12 57	13 01	13 00	76 13	53 18	149.5	149.5
4	G. C. Marlar (Falcon Six, G. Six)	DTD	17	29 30	12 36	11 23	11 26	11 22	76 17	46 47	170.5	159
5	W. P. I. Fillingham (Chipmunk, G. Maj. 10) ...	LWB	10	19 35	15 08	13 53	13 50	13 52	76 18	56 43	140.5	138.5
6	T. G. Knox (Proctor 3, G. Queen 2)	MBS	15	23 25	14 11	12 51	12 59	12 56	76 22	52 57	151	150.5
7	R. R. Paine (Hawk Speed Six, G. Six IF) ...	DGP	22	35 25	11 10	09 59	10 00	10 00	76 34	41 09	194	176.5
8	J. M. Wilson (Vampire 9, Goblin 2)	WR 211	23	59 33	05 13	03 56	03 57	03 56	76 35	17 02	468	445
9	D. F. Ogilvy (Club Cadet, G. Maj. 1)	CMP	2	01 05	19 49	18 26	18 32	18 45	76 37	73 32	105.5	106.5
10	R. Matthews-Naper (Messenger 2A, C. Maj. 3)	EI-AFH	6	13 20	16 57	15 35	15 30	15 38	77 00	63 40	125	124
11	J. de M. Severne (Vega Gull, G. Six 2) ...	FBC	16	25 45	13 42	12 29	12 33	12 33	77 02	51 17	155.5	154.5
12	J. Rush (Falcon Six, G. Six I)	ECC	18	29 45	12 44	11 29	11 36	11 33	77 07	47 22	168.5	161
13	M. R. T. Chandler (Tiger Moth, G. Major IHC)	MLH	3	04 55	19 09	17 45	17 38	17 47	77 09	73 19	110.5	110.5
14	J. N. Somers (Gemini 3, 2 G. Maj. IC) ...	KDC	19	30 10	12 42	11 24	11 31	11 30	77 17	47 07	169.5	169
15	B. J. Snook (Tiger Moth, G. Maj. I)	MJN	1	—	20 28	18 53	18 55	19 04	77 20	77 20	103	104
16	P. W. E. Heppell (Tiger Moth, G. Maj. I) ...	MLH	5	07 55	18 29	17 04	16 58	17 08	77 34	69 39	114.5	114.5
17	W. P. Bowles (Messenger 2A, C. Maj. 3) ...	JYZ	8	17 05	16 02	14 48	14 57	14 47	77 39	60 34	131.5	132
18	F. Bullen (Hart, Kestrel 16)	BMR	20	30 40	12 43	11 32	11 34	11 25	77 54	47 14	169	171
19	C. G. Alington (Comper Swift, Pobjoy) ...	BUS	9	18 10	15 49	14 36	14 42	14 45	78 02	59 52	133.5	134
20	A. W. Bedford (Whitney Straight, G. Maj. I) ...	EUJ	7	16 55	16 19	14 58	14 57	14 58	78 07	61 12	130.5	130.5
21	T. W. Hayhow (Aiglet Trainer, G. Maj. I) ...	MOS	11	20 00	15 39	14 17	14 15	14 17	78 28	58 28	136.5	135
22	F. Dunkerley (Gemini 1a, 2 C. Min. 2)	KKB	21	30 40	13 00	11 42	11 48	11 45	78 55	48 15	165.5	172.5
23	L. S. Loveridge (Hawk Tr. 3, G. Maj. IHC) ...	KMN	13	21 45	15 35	14 02	14 05	14 04	79 26	57 41	138	138

THE KING'S CUP RACE (Concluded from page 61)

and Severne followed, and then, like a thunderclap, the Vampire streaked by in a perfect vertical turn.

Marlar then made a similar, if slower, turn just outside the pylon, leading Loveridge, Rush, Somers (who was leaving a little smoke), Bullen, Paine and poor Dunkerley.

The Vampire finished Laps 2 and 3 in fine style. And then the real excitement began, for the next man in would be the winner. Round the northern horizon, some eight miles distant, all the piston-engined types could be seen moving apparently quite slowly; the leading aircraft then turned on to their final leg and were very near home when the Vampire appeared on leg three, moving along the horizon like a bullet.

But the first "slow" man was too near to be caught, and it was the silver Taylorcraft of Cyril Gregory which arrived first. He was chased in by the Proctors of Parker and Lawrence, the remainder finishing in the order shown in the table above. Most impressive was the manner in which Wilson steered the Vampire through the *mêlée* some 400 m.p.h. faster than most; he was, of course, allowed to land at once, the other competitors being kept orbiting until the Vampire was safely down.

The weather was by now warm and sunny—heartening, in fact, for the excellent flying display which ensued. Contributions were made by individual and team aircraft from No. 803 Squadron, R.N. (Attackers), and the R.C.A.F. wing at North Luffenham (Sabres), both demonstrations being commendable. This Navy unit has certainly mastered formation rolls, while the Canadians were assisted by the appearance (still novel, unfortunately, to an English crowd), of their swept-wing mounts and by the dramatic effect of their smoking exhausts.

Worthy of the highest praise were the Meteor display by F/O. A. J. A. Ellwood (son of Air Marshal Sir Aubrey Ellwood), and the flying of the Bristol F.2B Fighter by W/C. "Dicky" Martin. A sleek 101 squadron Canberra and G-ALYW, one of the newest Comets, also assisted, as did the Vampires of 607 (County of Durham) Sqn., R.Aux.A.F. Seasoned demonstrators were "Sox" Hosegood (Bristol Sycamore 3), Prince Cantacuzene (Jüngmeister), S/L. "Dusty" Miller (Tiger Moth crazy flying), and these distinctive artists, la Patrouille d'Etamps (Stampe S.V.4B). Finally, credit is due to Gerard Smith (Slingsby Sky), and to the Apex group of parachutists, three members of which jumped despite the near-gale which was by now blowing.

Field Marshal Lord Montgomery of Alamein, Deputy Supreme Commander at Fontainbleau, who had arrived in a Dakota before lunch, presented the National Air Race prizes, afterwards driving round the enclosures in his famous Humber staff car with the recipients. They received the applause of the 30,000 present—a reasonable crowd, when the rather unsettled weather is considered. Certainly, everyone present had reason to go home well contented; the meeting will be remembered as one of the best in the classic series.

SERVICE AVIATION

Royal Air Force and Naval Aviation News

MASTER OF BALLIOL is, in this instance, not the renowned Dr. Jowett but the Boulton Paul chief test pilot, Ben Gunn. The versatile trainer is shown in production on page 76 of this issue.

R.A.F. Appointments

APPEARING in the half-yearly list of promotions as having been promoted from the rank of A. Cdre., A.V-M. H. V. Satterly, C.B., C.B.E., D.F.C., it is now announced, is to succeed the late A.V-M. D. F. W. Atcherley as A.O.C. No. 205 Group, M.E.A.F. Until recently A.V-M. Satterly was Director of Operational Requirements (A) at the Air Ministry and prior to that appointment was Assistant Commandant of the R.A.F. Staff College, Bracknell.

The new Director of Operational Requirements (A) is A. Cdre. W. H. Kyle, C.B.E., D.S.O., D.F.C., A.D.C.

After serving for two years as A.O.C. No. 22 Group, Technical Training Command, A.V-M. B. V. Reynolds, C.B.E., is to become A.O.C. Malta. A.V-M. H. A. Constantine, C.B., C.B.E., D.S.O., is to leave the Air Ministry, where he has been Director of Intelligence since April, 1951, to go to Fighter Command as A.O.A.

Another R.C.A.F. Fighter Squadron

THE formation early in July of a new R.C.A.F. Sabre-equipped fighter squadron, No. 434, to be located at Uplands, near Ottawa, has been announced.

The new squadron will be commanded by W/C. J. D. Mitchner, D.F.C., and will fly Canadair-built F-86 Sabres.

No. 434 Squadron will be taking over facilities formerly used by 439 Squadron, which left for Britain on May 30th last. An advance party of 434 Squadron personnel is already at Uplands and it is expected that the squadron will be fully operational by mid-August.

During the second World War No. 434 Squadron operated overseas as a heavy bomber squadron with the R.C.A.F.'s No. 6 Group. It was formed in June, 1943.

W/C. Mitchner is a fighter pilot who completed two tours of operations during the war. He was awarded the D.F.C. and later a Bar to that decoration for outstanding gallantry and was credited with destroying 10½ enemy aircraft.

Operations In Malaya

THE offensive air support operations of the R. A. F. and R.A.A.F. in Malaya during June showed a slight increase. Most of the sorties were in support of Gurkha units operating around Kuantan in pursuit of the terrorist gang, which is now being rapidly eliminated and was once led by the infamous Manap Jepun, who was killed at the end of May. R.A.F. Valettas dropped some 200,000 lb of supplies to security forces in the jungle and isolated police posts. Anti-shipping patrols were flown by Sunderlands of the Far East flying-boat wing off the coast of Malaya, and Brigands provided air cover for road convoys in the Cameron Highlands area. Leaflet drops, P.R. sorties and air-lifts were also in the day's work, and the helicopter casualty evacuation flight dealt with eleven casualties.

A MODEL AIRCRAFT: Sir George Nelson, right, chairman of the English Electric Co., presenting a silver model of a Canberra to A.V-M. D. A. Boyle, A.O.C., No. 1 Group, who accepted it on behalf of the H.Q. Officers' Mess. The gift is to commemorate the formation of the first Canberra squadron in No. 1 Group.

No. 29 Squadron's New C.O.

EQUERRY to the Duke of Edinburgh, S/L. P. Horsley, A.F.C., has left a staff post at Fighter Command headquarters and been given command of No. 29 (Fighter) Squadron. Appointed extra equerry to Princess Elizabeth and the Duke of Edinburgh in 1949, S/L. Horsley has continued as equerry to the Duke since the accession of the Queen. His most recent duty was to accompany the Duke on his visits to Coastal Command headquarters and R.A.F. Station St. Eval, in May. Before going to H.Q., Fighter Command, he was adjutant to the Oxford University Air Squadron.

No. 29 Squadron was formed in 1915 as a day fighter unit. During the second World War it was mainly engaged on night fighting and intruder work. It now has Meteor aircraft.

No. 5 Wants History

ONE of the original four R.F.C. squadrons to take the field in France in 1914, No. 5 Squadron, which has been disbanded for a long while, has recently been re-formed.

The Squadron's new C.O., S/L. V. G. Daw, is endeavouring to trace the unit's history and would be extremely grateful for any records or photographs which might help to this end.

Vickers Trophy

THE winning of the Vickers Trophy (recorded on page 34 last week) is No. 70 Squadron's second competitive triumph this year. Earlier it won the first inter-transport squadron drill competition ever held in the Canal Zone. One of the oldest Squadrons in M.E.A.F. Command, No. 70 Squadron is at present commanded by S/L. L. Reavell-Carter, M.B.E., was formed 36 years ago at Farnborough, and has spent the past 32 years in the Middle East. During the first World War, as a fighter squadron, it had a brilliant operational record, and between 1916 and 1918 shot down 304 enemy aircraft.

From 1919 to 1920 the squadron sur-

SERVICE AVIATION . . .

veyed and helped to develop the air route from Egypt to Baghdad, over which, by 1921, air mail was being regularly carried. In 1923, in what is believed to have been the first movement of troops by air, No. 70 Squadron moved two companies of Indian troops from Kingerban to Kirkuk, and in December, 1928, it carried out the first air evacuation of civilians. On that occasion, flying Vickers Victorias, it evacuated 566 persons from Kabul, in Afghanistan, to India.

During the recent Anglo-Egyptian emergency the squadron played a large part in the air-lift of thousands of troops and tons of equipment and supplies into the Canal Zone from Cyprus and elsewhere in the Middle East.

New C.O. for No. 410

IT has been announced that S/L. L. A. Hall is giving up command of No. 410 Squadron, R.C.A.F. at North Luffenham and is going to Paris on the R.C.A.F. planning team. Command of No. 410 will be taken over by S/L. D. Warren, D.F.C.

Korea Duty Tour

IT has been announced that the tour of duty with No. 77 squadron, R.A.A.F. in Korea would, from this month, be reduced from nine months to six.

The change in the operational role from fighter sweep to ground attack in recent months had meant many pilots recording a greater number of sorties than previously, although there had been little change in flying hours. In January pilots completed their tour of duty with 100 sorties. They were now averaging 180 sorties—225 flying hours.

R.A.F. Athletes in Brussels

SPORTSMEN of the R.A.F. scored many successes at the Heysel stadium on Sunday in events held in conjunction with the great NATO gathering reported on page 63. Places (first except where otherwise stated) were won in the following: 400 m hurdles, O/Cdt. T. S. Farrell; 1,500 m L.A/C. P. B. Driver; 400 m flat, (1) A/C. S. R. Meadows, (2) P/O. J. R. Thirnbeck; long jump, Sgt. E. Darlow; 110 m hurdles, (2) F/O. J. G. M. Hart; 100 m flat, (3) A/C. G. S. Ellis; relay (4 x 400 m), F/L. C. A. Guest, P/O. Thirnbeck, A/C. A. F. Sanderson, A/C. S. R. Meadows; pole vault, Cpl. G. C. Calladine (tied for first place).

Half-Yearly Promotions

IN continuation of the names published last week, below is a further list of half-yearly promotions announced by the Air Ministry.

Squadron Leader to Wing Commander.—R. F. Harman, D.F.C., A.F.C.; P. G. Louis, D.F.C., D.F.M.; P. M. Brothers, D.S.O., D.F.C.; W. R. Williams, D.F.C.; J. B. Coward; D. B. Gericke; W. D. Hodgkinson, D.F.C., A.F.C.; H. Burton, D.S.O., M.B.E.; A. S. Mann, D.F.C.; C. M. Clementi, O.B.E.; H. V. Bunting; A. R. Wright, D.F.C., A.F.C.; L. S. Pegg; R. Allison; R. J. Bedells; R. B. Stocks; D. McDermott; A. P. Crowley; F. W. Avery; H. Crosby; G. F. Corden; E. Mortimer; E. V. Stokes, B.Sc.; A. F. Ward, O.B.E.; J. H. Hunter-Tod, M.A., D.C.Ae., A.F.R.Ae.S.; E. J. Andrews; V. A. Tidey; R. G. Burnett, M.B.E.; F. H. Dimmer; G. A. Pearson, M.V.O.; D. H. Grundy, A.F.R.Ae.S.; G. S. W. Kerslake, M.B.E.; B. R. Siminson; W. F. M. McDonagh; J. H. Cocks; N. W. Kearon, O.B.E.; E. W. Poppy; S. V. Perry, O.B.E.; C. E. Beer, O.B.E.; W. M. Nowell; P. J. George; H. B. Scully; H. D. Bisley, O.B.E., A.F.C.; J. W. Taylor, O.B.E.; E. Cotton, D.F.C.; F. E. Frayn, M.B.E.; S. J. H. Carr, D.F.C.; J. B. Denning; H. S. Maurice-Jones; E. D. Newell, O.B.E.; C. B. Appleby, D.S.O.; D. Stevenson, M.B.E., M.D., Ch.B.; I. W. H. R. Cran, M.R.C.S., L.R.C.P.; T. H. Redfern, M.B., Ch.B., M.R.C.S., L.R.C.P.; D. Crichton, M.B.E., M.B., Ch.B., D.P.H., D.I.H.; G. C. Baird, L.D.S.; O. B. Balean, L.D.S.; H. V. Jessop, L.D.S.; D. C. P. Battersea, F.D.S.R.C.S., M.R.C.S., L.R.C.P.; F. G. Carroll, B.Sc., A.R.C.S.; B. N. Keeling, B.A.; J. R. Coulson.

Squadron Officer to Wing Officer.—K. M. Collins, M.B.E., W.R.A.F.; E. M. Tilbrook, R.R.C., P.M.R.A.F.N.S.; M. R. Gall, A.R.R.C., P.M.R.A.F.N.S.

Flight Lieutenant to Squadron Leader.—T. E. Ison, D.S.O., D.F.C.; R. P. Elliott, D.S.O., D.F.C.; W. G. Spencer; E. Binks, D.F.M.; J. Catley; J. W. Moffatt; W. A. Allinson, D.F.C., D.F.M.; W. H. Banks; L. L. Doveton; J. J. Hall; E. S. Smith; J. J. Barr; T. W. Kelly; D. P. Boulnois; P. H. Cleaver, D.F.C.; P. A. S. Thompson, D.F.C.; G. Sproates; G. P. Lewis; E. L. D. Drake, D.F.C.; H. S. Smith; M. W. Huggins, D.F.C.; S. Kirtley; W. A. M. Dunjey, A.F.C.; S. M. Mackay, A.F.C.; A. J. Houston; P. D. Thomson, D.F.C., D.F.M.; D. H. Chopping, D.F.C.; N. J. Carver; W. A. Thynne, D.F.C., M.M., B.E.M.; G. A. Mason, D.F.C.; A. C. Hollingsworth; R. C. Penning; J. Jagger; H. J. Pavitt; H. R. Kerr, M.B.E.; J. F. J. Dewhurst, D.F.C.; K. L. Monaghan, D.F.C., D.F.M.; J. Davis, A.F.C.; J. R. Lake, D.F.C., A.F.C.; W. J. Williams, D.F.C.; W. K. Greer, A.F.C.; D. M. Finn, D.F.C.; W. Harrison; A. W. Bower, D.F.C.; I. Thomas, D.F.C.; K. R. Penry; H. M. Carson; B. W. Parsons, A.F.C.; E. Stephenson; H. King; V. E. Long, A.F.C.; J. R. Mason; H. G. Davies; L. B. Foskett, A.F.C.; D. C. Lowe, D.F.C., A.F.C.; R. E. Charlton, D.F.C., D.F.M.; H. E. Walmsley, D.F.C.; C. S. Hunton, D.F.C., A.F.C.; R. Crouch, D.F.C.; J. C. W. Davies; C. A. Rennie, D.F.M.; N. Poole; K. H. H. Cook, D.F.C.; C. L. C. Mason; P. N. Speed, A.F.C.; E. Gillies, D.F.C.; J. F. Hacking, D.F.C.; C. N. Spurdens, D.F.C., A.F.C.; R. W. Mathers, D.F.C.; H. H. Jenkins; G. Strange; N. G. S. Marshall; W. R. Ringrose, D.F.C.; P. H. J. Buddery; E. Lee, D.F.C.; H. J. Cobb, D.S.O., D.F.C.; J. C. W. Weller, D.F.C.; J. E. Close.

(*To be continued*)

LEE-ON-SOLENT'S BIG DISPLAY

H.M.S. Daedalus "At Home" to the Public

FOR their annual air display this year, R.N. Air Station Lee-on-Solent obtained the support of the Society of British Aircraft Constructors, and by so doing managed to treat the thousands of visitors to a preview of some of the aircraft the Navy will be operating in the future. This novelty, however, only added the super-finish to an already polished programme witnessed by the C.-in-C. Portsmouth, Admiral of the Fleet Sir Arthur J. Power, who headed the large number of distinguished visitors.

Firebrands of 813 Squadron demonstrated rocket-assisted take-off, and the Saro Skeeter joined S.51s and an S.55 in showing-off rotary-wing versatility. This turn was completed when Major "Dumbo" Willans made a parachute drop from an S.51—a strong wind, however, carried him to a landing obscured from view by trees in the "in-field" between the runways. A quartet of Attackers from 800 Squadron looped and rolled off the top in quite closely maintained consort, and were followed by a solo turn of high-speed aerobatics in a similar machine: unfortunately, both tailwheels of this aircraft collapsed on touch-down, and the base of the tail-cone got rather worn-away by friction.

Lt-Cdr. Sproule gave the polished display of gliding aerobatics now expected of him, and was followed by a nostalgic ten minutes during which a Swordfish, Gladiator and Fulmar showed the crowd the quiet docility of yesteryear. They were joined, just before landing, by a Gannet and, together with the Tiger which had towed-off Sproule's sailplane, and an errant Chipmunk which suddenly appeared, the sky took on the appearance of a spotters' benefit. The Gannet was flown on one and both Mambas, with everything up and with everything, except the dustbin, down; a Firefly 6 took off and was followed by a Sea Hawk and a Wyvern, the latter complete with red-headed torpedo. The Sea Hawk caused a gasp by its silent flashing approach, and fast diminishing thunder as it climbed, slowly rolling, up to the sun-shot clouds.

Another naval newcomer then took-off: the Vickers-Supermarine 508. With the enormous power reserve of its twin Avons, the butterfly-tailed fighter was hauled round into a tight turn within the airfield boundary straight after take-off and then surged up into a roll off the top. The precision of its aileron control was obvious, but we frankly admit to feeling frightened when, the aircraft flying past at moderate speed and straight and level, we saw the ailerons fluttering like leaves in a gale—a horrible sight. To take our mind off this unpleasant event, the Vickers 535 appeared like a silver flash from up-sun, to come back rolling with carefree élan. Then came the Wyvern, heralded by a low hum from its Python, and seemingly not in the least aerobatically embarrassed by having a torpedo slung underneath.

The evergreen instructor and pupil *divertimento* was given in a pair of Harvards, but lost some of its usual appeal because the pupil was too good: it is, of course, necessary to be able to fly wonderfully well in order to be able to fly wonderfully badly. A Sunderland from, we imagine, Calshot, flew over quietly and sedately and drew appreciative noises from a group captain standing beside us, then reappeared at about 60ft and with both port airscrews feathered: a confidence-inspiring sight.

The Royal Marines of No. 1 Special Boat Section were to have jumped from a balloon in a simulated airborne attack on a "strong-point" of wood and fabric erected on the airfield. The wind was too strong for this, however, and instead a two-lap handicap race was laid on between a Firefly, Sea Fury and Meteor 7. The course was Lee-Portsdown-Calshot-Lee, and the Firefly was completing its first lap as the Meteor got airborne. Handicapping was excellent, for the Firefly just scraped home by yards from the Meteor, with the Sea Fury close behind.

A mass formation fly-past by Firebrands, Sea Furies and Fireflies, after a stream take-off, was impressive, and the "strong-point" was smokingly destroyed to the satisfaction of all. Despite the rough wind and occluding cloud, the threatened rain held off and the 18,000 spectators all had a thoroughly enjoyable afternoon.

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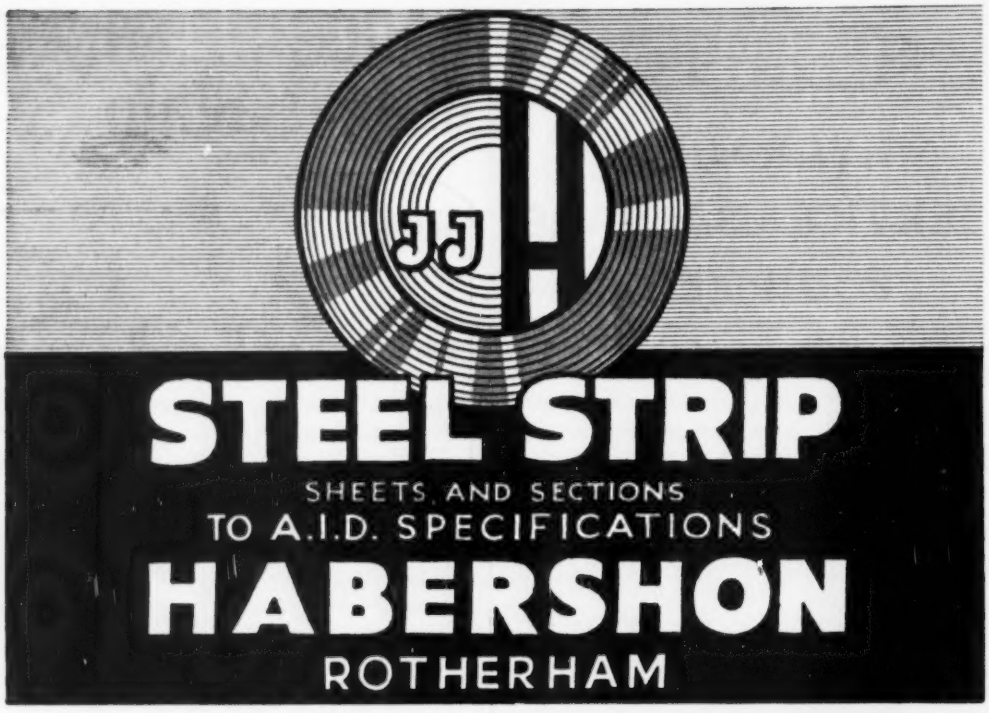

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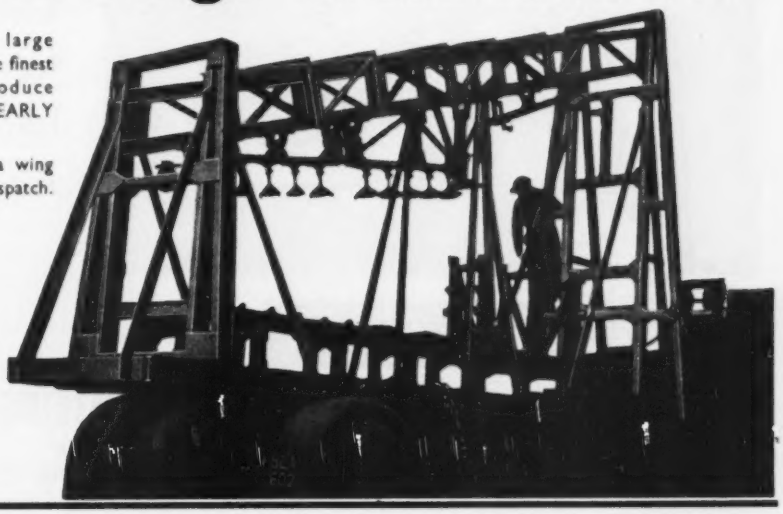

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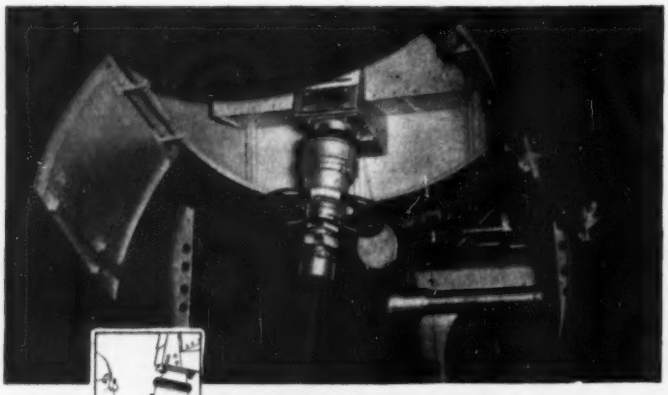

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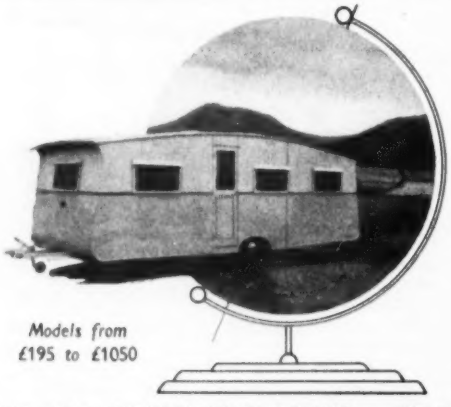

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AEROCONTACTS, Ltd., leading distributors of new and used aircraft. Large stocks held at Gatwick for immediate inspection and early delivery. Specialist stockists of D.H. Dragon Rapides. "Aerocontactalogue" free on request.—Gatwick Airport, Horley 1510. [0000]

AIRCRAFT WANTED

MILES MAGISTER with long term C. of A. and engine hours.—Box 8886. [0003]

WISH to buy Auster and Gemini.—Write: Heuby, Rue Castara, Luneville, France. [0013]

RAPIDE with long term C. of A. and engine hours, multi-channel V.H.F.; S.B.A. and/or radio compass.—Box 8962. [0002]

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WANTED, Two magnetos for Gypsy Major engines.—Box 1379. [0022]

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CRACK detection by Magna Flux. A.R.B. Certificate of Compliance coverage for aircraft parts. Prompt service; reasonable charges.

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REPAIRS and C. of A. overhaul for all types of aircraft.—Brooklands Aviation, Ltd., Civil Repair Service, Sywell Aerodrome, Northampton. Tel.: Moulton 3233. [0007]

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CAPACITY for producing forging dies and copy milling capacity for turbine blades.—Apply, Armytage Bros. (Knottingley) Ltd., The Foundry, Knottingley, Yorks. Tel. 46. [0024]

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What a stupid advertisement! Caravans haven't a love life! But U.K.'s largest distributor with—but surely you know it already—U.K.'s largest selection, all guaranteed for one year and a free-van-lent-for-faulty one and all-repairs-free, does love people. Too much. He's believed almost every hard-luck story he's been told (the old fool! and he'll go on doing it because 90% are genuine). There's the Caravan Residents' Association to get and keep you a site (A.S.J. Secretary). Free rail fares to those far boway if van bought. Fair h.p. terms and rather better acceptances from 'e h.p. companies because—well, they know I've got a better business! So why not write for 1 lb of free brochures and advice articles to Dept. F. C. Taplow, please!—A. S. Jenkinson, Ltd. (our equal selection, London branch), 90, Oxford Street, London, W.1 (corner of Rathbone Place) Tel.: Langham 8887/7. Two minutes from Tottenham Court Road Tube Stations. Open till 8 p.m., 7 days a week; Bath Road, Taplow, Bucks. Tel.: Maidenhead 3434/5/6. Always open. Easy to reach—right on Main A.4. Outside Maidenhead. Taplow Station 4 mins. Now open: Hammersmith Branch, Corner of Sussex Place and Hammersmith Bridge Road, W.6 (one minute Hammersmith Broadway. Open till 8 p.m. every day). [0026]

NEW "Statesman." £1,965. Other Berkeleys from £309/10/-. New Glitter 4-berth de luxe, £399/10/-, and 2-berth, £313. Safari, £395. Towing. Hire purchase.—Mantles Garages, Ltd., Biggleswade. Tel. 2113. [0027]

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WING COMMANDER R. H. STOCKEN, F.R.Ae.S., Eagle House, 109, Jermyn St., London, S.W.1. Tel.: Whitehall 8883. [0419]

CANADA-G6. Britain Liaison service. Technical and Sales. Personal contact.—W. P. Dunphy, Consulting Air Engineer, Montreal Airport, Montreal, Canada. [0340A

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RIVETING machine for sale, unused, portable type, with range of equipment. Manufactured by Chicago Pneumatic Tool Co. Operates from 60 lb air line. Accept about quarter of its real value.—Box 1369. [0410

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IF you want to sell your aircraft radio equipment, why not contact Aerocontacts, Ltd., Gatwick Airport, Tel.: Horley 1510, Ext. 22. [0002

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STAFF item checking and job-costing time recorders (all makes) for quick cash sale; exceptional condition.—Box 7241. [0046

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SITUATIONS VACANT

The engagement of persons answering these advertisements must be made through the local office of the Ministry of Labour and National Service, etc., if the applicant is a man aged 18-64 or a woman aged 18-59 inclusive, unless he or she or the employer is excepted from the provisions of The Notification of Vacancies Order 1952.

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BURMA

REQUIRED IMMEDIATELY

ONE "B" engineer with endorsement for Dakota. (Preference will be given to applicant also endorsed for Dove.)

Salary (Nett after deduction of Burma income tax) £372 per month.

ONE "D" engineer with endorsement for Queen 70. (Preference will be given to applicant holding "C" endorsement on S.1039-52.)

Salary (Nett after deduction of Burma income tax) £246 per month.

ONE "X" propellers engineer, Hamilton and D.H., including Governors. (Preference will be given to applicants holding "A" and/or "C" on Dakota and/or Dove.)

Salary (Nett after deduction of Burma income tax) £148 per month.

CONTRACT: 2 years.

LEAVE: Home: 1 month per year of service.
Local: 14 days per annum.

ACCOMMODATION: Married: company bungalow.
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FREE PASSAGES for employee and family.

APPLICANTS to apply direct by Airmail to:—

THE GENERAL MANAGER,
UNION OF BURMA AIRWAYS
104 STRAND ROAD,
RANGOON,
BURMA
(All applications will be answered.)
Rangoon, 16 June, 1952 [0390

STATES OF JERSEY AIRPORT

THERE is an immediate vacancy for an air traffic control officer, Grade III, at Jersey Airport. Candidates must have had experience either as:—
(a) Aircrew in civil air transport with considerable experience in the United Kingdom, or
(b) Pilot or navigator in the Armed Forces, preferably with considerable experience of air traffic control in the United Kingdom.

EXCEPTIONALLY, candidates without aircrew experience will be considered, provided that they have had considerable practical experience of duties directly concerned with the operation of air traffic control. Preference will be given to candidates who, through their previous experience, are eligible for early certification by the Ministry of Civil Aviation.

RATES of pay range from £420 per annum at the age of 23 to £630 per annum at the age of 30 or over, on entry, rising by annual increments to £885 per annum. The successful candidate would be eligible for establishment in the States of Jersey Civil Service on completion of a probationary period.

APPLICATIONS, with full details of age, education, qualifications and experience, should be addressed to the Airport Commandant, Jersey, Channel Islands. The latest date for receipt of applications is July 26th, 1952. [0472

SITUATIONS VACANT

CIVIL SERVICE COMMISSION

(1) Naval Cadetships (Special Entry).
(2) First appointments in the Royal Marines.
(3) Entry to the Royal Military Academy, Sandhurst.
(4) Royal Air Force Cadetships.

A combined competition will be held, commencing on October 28th, 1952. A centre in Germany (British Zone) will be included in the list of centres for the written examination.

AGE limits—

NAVAL cadetships (special entry), 17 years 2 months to 17 years 10 months on November 1st, 1952.
FIRST appointments in the Royal Marines, 17 years 3 months to 18½ on November 1st, 1952.
ENTRY to Royal Military Academy, Sandhurst, 17½ to 19½ on November 1st, 1952.
ROYAL AIR FORCE cadetships, 17½ to 19 on November 1st, 1952.

APPLICATION forms and conspectus of the competition may be obtained from the Secretary, Civil Service Commission, Burlington Gardens, London, W.1, quoting No. 1930/52. Completed application forms must be received by him by August 14th, 1952. (3310/179 WP.) [8405

ROYAL NAVY

YOUNG men between 17 and 24 years are required for short service commissions in the Royal Navy for 8 years' flying duty as pilots or observers. Up to 20 per cent. of those completing the engagement will, if suitable, be given permanent commissions. The remainder will pass to the Reserve for 7 years and be paid a tax-free gratuity of £1,500. Applicants must have School Certificate with a pass in mathematics or a General Certificate of Education with passes at ordinary level, in English language, mathematics and one other subject, or equivalent educational qualifications, and be physically fit.

WRITE to Secretary of the Admiralty (C.W.S20), Queen Anne's Mansions, London, S.W.1. [8194

HANDLEY PAGE, Ltd., have vacancies for:

AERODYNAMICISTS of degrees standard or with H.N.C. in aero subjects. Previous experience preferred.
STRESSMEN of degrees standard or with H.N.C. in aero subjects. Previous experience preferred.
SENIOR design and intermediate draughtsmen, preferably with aircraft experience, for Cricklewood and Radlett offices. Consideration will be given to applicants with experience in light structural or mechanical engineering. Possession of O.N.C. or H.N.C. (Mech. or Elect.) an advantage.
WEIGHT control engineers, with O.N.C. (Mech.). Previous experience preferred.
TECHNICAL assistants of degree or H.N.C. (Elect.) standard for the design and development of aircraft electrical systems. Previous experience preferred.
SENIOR and junior assistants of degree or H.N.C. standard for the Mechanical and Structural Test Dept. at Radlett.—Write, stating age, qualifications and details of experience, to Staff Officer, Handley Page, Ltd., Cricklewood, London, N.W.2. [8211
SENIOR draughtsmen required.

EDUCATION to Higher National Certificate, Engineering apprenticeship essential. Five years D.O. experience. Preferably knowledge of light mechanical engineering. Location, Surrey.—Apply, with particulars of age, experience, and salary required to Box 1388. [8437
VICKERS-ARMSTRONGS, Ltd. (Aircraft Section), have vacancies at Hurn Depot for the following:—
TECHNICAL staff: Aircraft stressmen. Design draughtsmen (aircraft experience preferable, but not essential). Jig and tool draughtsmen (aircraft experience preferable, but not essential).
APPLY in writing to the Employment Manager, Vickers-Armstrongs, Ltd. (Aircraft Section), Weybridge, Surrey.
APPLICATIONS, with certain exceptions, are subject to the approval of the Ministry of Labour and National Service. [8406
A WELL-KNOWN brake and clutch lining manufacturer requires a technical representative for the automobile and aircraft industries.
APPLICANTS should be between 25-35 years of age, well educated, personable, and should be prepared to live in the Birmingham area. A thorough engineering training is essential. Applicants with an automobile engineering background and service will be preferred. Excellent prospects for the right man.
WRITE, stating qualifications and experience, to Box 1396. [8392
PREVIOUS applicants should not re-apply.

"A" or "C" licensed engineer for light aircraft at Carlisle Airport. Bungalow available if married man.—Apply, Air Navigation, Blackpool Airport. [8429
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AIRWORK, Ltd., requires an "X"-licensed instrument inspector for work on Vikings and Hermes aircraft.—Apply to Manager, Airwork, Ltd., Blackbushe Airport, Nr. Camberley, Surrey. [8421
AIRCREW leaving the Services—be qualified before discharge.—Obtain your M.C.A. licences through Aviation, Ltd., 30, Central Chambers, Ealing, W.5. Tel. Ealing 6949. [8249
LICENSED radio engineer and radio mechanics at our base at Stansted Airport, Essex.—Apply, by letter or telephone, to the Senior Radio Engineer, Aviation Traders, Ltd., Southend Airport, Essex. Tel.: Rochford 55491. [8350
PORTSMOUTH AVIATION have vacancies for stressmen of all grades for super-priority work at Portsmouth and Hurn Airports.—Apply: The Airport, Portsmouth. [8151
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TECHNICIANS.
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APPLICATIONS are invited from senior and junior stressmen and draughtsmen for work on new designs. Applications should state age, experience, qualifications and salary expected.—Auster Aircraft, Ltd., Rearsby Aerodrome, Leics. [8008

SENIOR electronic engineer required. Experience of helicopter instrumentation and of analogue computors would be an advantage.—Apply, stating experience, age, etc., to the Personnel Officer, Saunders-Roe, Ltd., Southampton Airport, Eastleigh, Hants. [8356

WEIGHT estimator required by Percival Aircraft, Ltd., Luton Airport, Beds, for work on fixed wing and helicopter aircraft.—Apply, giving details of age, qualifications, experience and salary required, to: Manager, Ministry of Labour and National Service, Luton, Beds. [8592

ASSISTANT chief stressman required by Percival Aircraft, Ltd., Luton Airport, Beds.—Applications, giving full details of qualifications, experience, age and salary required, to the Manager, Ministry of Labour and National Service, Luton. [8593

TECHNICAL authors and illustrators required by Percival Aircraft, Ltd., Luton Airport, Beds. Knowledge of M.o.S. procedure desirable.—Applications, in writing, stating age, experience and salary required, to Manager, Ministry of Labour and National Service, Luton, Beds. [8594

EXPERIENCED licensed "A" and "C" aircraft engineer on Doves and Consuls required; able to undertake sole responsibility for maintenance. Good salary offered. Please state experience on above aircraft.—Westminster Airways Servicing, Ltd., Priory Road, Hardway, Gosport. [8604

SENIOR aircraft draughtsman required for modification and development work on modern aircraft. Administrative experience and first-rate technical ability essential. Excellent salary, pension scheme and prospects for right applicant.—Applications with full details as to age, experience and salary required, to Box 1377. [8419

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H. M. HOBSON, Ltd., invite applications for positions in the drawing office as follows: designers, detail and modification draughtsmen, checkers, stressmen. The work is concerned with interesting projects connected with fuel metering equipment and hydraulic flying controls for aircraft.—Hobson Works, Fordhouses, Wolverhampton. [8430

LANCASHIRE AIRCRAFT CORPORATION, Ltd., Hawarden Airport, Flints, require qualified pilots, navigators and radio officers for their York fleet. Only applicants holding appropriate M.C.A. licences will be considered.—Please write full details to the Personnel Manager, at above address. [8390

IMPORTANT Midlands gas-turbine aircraft-engine manufacturer has vacancies for a number of designers and senior and junior draughtsmen. Although experience is most advantageous, it is not necessarily essential as training will be given.—Apply in some detail, please, to Reference F101, Box 0693. [8616

TECHNICAL assistants, experienced in dealing with electronic measurement and instrumentation, required for work on aero engines and their application. Candidates, aged between 25 and 30, possessing degree or diploma and willing to deal with problems during flight preferred.

APPLICATIONS, stating age, qualifications, and details of experience, should be addressed to the Divisional Personnel Manager, The Bristol Aeroplane Co., Ltd., Engine Division, Filton House, Bristol. [8366

SENIOR mechanical engineer required by new division of prominent engineering establishment in Northern Ireland to lead section engaged in development of guided weapons. Degree or equivalent in mechanical engineering, with good practical experience in one or more of the following:—
(a) Hydraulic or pneumatic servo systems.
(b) Medium and light mechanisms.
(c) Instruments.
GOOD salary and prospects for man with originality. Assistance given with housing.—Send full particulars of age, qualifications and experience, to Box 1356. [8407

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INSTALLATION and service engineer required by manufacturer of aircraft instruments. Practical experience of current electric and electronic navigation instruments is essential.—Applications are invited, stating age, previous experience and salary required, to Box 1369. [8401

SENIOR design and intermediate draughtsmen with good experience of aircraft or light structural or mechanical engineering required for aircraft and armament project work at Portsmouth and Hurn offices.—Apply by letter to Portsmouth Aviation, Ltd., The Airport, Portsmouth. [8391

D. NAPIER AND SON, Ltd., Luton Airport, Beds, require an estimator. Should have good previous aircraft experience and preferably on experimental aircraft engine installations.—Please apply to your nearest Employment Exchange, giving fullest possible particulars of age and experience and an indication of salary required. [8377

PRESS tool designers and jig designers are required by large engineering company in the Southampton area. Applications are invited from men with the necessary toolroom and draughting experience. High salary and good prospects for men with required ability.—Write, Box P.8306, A.K. Advg., 212, Shaftesbury Avenue, W.C.2. [8426

BRITISH EUROPEAN AIRWAYS require an assistant development engineer in the Project and Development Branch at Ruislip. A thorough knowledge of aircraft electrical systems and instruments with at least ten years' experience on aircraft is essential. The salary scale for this post is £670 to £950 p.a.—Written applications, giving full particulars of qualifications and experience, to Personnel Manager, B.E.A., Eyeline House, Ruislip, Middlesex. [8432

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SITUATIONS VACANT

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APPLICATIONS are invited from senior and intermediate design draughtsmen. Experience of aero-engine design desirable, but not essential. Also checkers.—Please write, stating age and giving details of previous experience in chronological order, to the Personnel Officer, The de Havilland Engine Co., Ltd., Stag Lane, Edgware, Middlesex. [9000]

AIR FORCE. Naval, civil and helicopter aircraft all under design and development at Percival Aircraft, Ltd., Luton Airport, Beds. Applications are invited from senior and junior draughtsmen, and stressmen, for work on this interesting programme.—Write, giving details of experience and salary required, to Manager, Ministry of Labour and National Service, Luton, Beds. [9395]

CHIEF test engineer required by large firm, S.E. England, for aeronautical division, with good technical education to B.Sc. standard. Practical experience of production problems connected with electronic servos in the aircraft industry. Progressive post. Pension scheme.—Write fully, stating age, experience, to Box F.360, at 191, Gresham House, E.C.2. [9409]

TWO engineers with experience of the testing and maintenance of airborne electronic equipment. For one post experience of servo-mechanisms would be an advantage. For the other, experience of radio transmitter-receivers. Applicants must have Higher National Certificate.—Write fully, stating age, experience, to Box F.305, at 191, Gresham House, E.C.2. [9417]

DRAUGHTSMEN and stressmen with aircraft experience required for interesting and progressive work on new designs. Permanent positions at attractive salaries for capable applicants. Opportunities for cheap flying with firm's Flying Club. Housing arranged and assistance given.—Applications to Chief Designer, Auster Aircraft, Ltd., Rearsby, Leicester, or through local Employment Exchange. [9389]

BRITISH OVERSEAS AIRWAYS CORPORATION have vacancies for pilots below the age of 27. Minimum qualifications include Commercial Pilot's Licence with Instrument Rating and Radio Telephony Licence. Commencing salary dependent on qualifications, £915 per annum to £935 per annum.—Application should be made in writing to the Chief Personnel Officer, B.O.A.C., Airways House, Great West Road, Brentford, Middx. [9430]

APPLICATIONS are invited from design draughtsmen and stressmen, also technical assistants with combined design and performance experience for work on both reciprocating and gas turbine aero engines.—Applications should state full particulars of experience and qualifications and should be addressed to the Personnel Officer, The de Havilland Engine Co., Ltd., Stag Lane, Edgware, Middlesex. [9002]

TECHNICIANS—aircraft. The Aircraft Design Technical Office of the Bristol Aeroplane Co., Ltd., requires the following personnel for work on an interesting range of civil and military aircraft and helicopters in their engineering development laboratory: Junior and intermediate technicians with Higher National Certificate and preferably some experience of structural or general engineering test work. These appointments offer excellent opportunities for advancement on merit.

APPLICATIONS should be sent to the Ministry of Labour and National Service, 20, Nelson Street, Bristol 1, and marked for the attention of the Personnel Manager, The Bristol Aeroplane Co., Ltd., Aircraft Division, Filton House, Bristol. [9375]

NORMALAIR, Ltd., require for the London office first-class design and detail draughtsmen, experienced in light mechanical precision engineering or instrument practice and with aircraft background, for aircraft pressurising and high-altitude breathing equipment. Good working conditions, and superannuation.—Apply stating age, experience, qualifications and salary required, to Employment Exchange (N.A.), Yeovil, Somerset. [9373]

LONDON company requires liaison engineers to call on Ministry, commercial and aircraft companies. Candidates must have technical background and practical experience. The work is essentially related to aircraft electrical equipment and accessories. Salary, car allowance and expenses, plus the benefits of a superannuation scheme, are offered to successful applicants. You should forward details of education, age, experience, etc., quoting reference J.56, to Box 1361. [9411]

AIRCRAFT draughtsmen are required by the English Electric Co., Ltd., at Warton Aerodrome, near Blackpool. There are a number of vacancies for men having good aircraft drawing-office background. Good salaries will be paid according to age, qualifications and experience.—Write, giving full details and qualifications, and quoting reference "English Electric 12/52," to Westminster Employment Exchange, Chadwick Street, London, S.W.1. [9408]

VACANCIES exist for senior and junior electronic engineers, on work in connection with the electronic measurement of physical variables and associated problems. This consolidation and expansion of a young department offers scope for men with enterprise and ability.—Applications, stating age, full details of qualifications, experience and salary required, should be addressed to the Personnel Officer, Saunders-Roe, Ltd., East Cowes, I.O.W. [9410]

GLOSTER AIRCRAFT Co., Ltd., Research Dept. A number of vacancies exist in the research department for technicians of ordnance or H.N.C. standard, for work in connection with flight test instrumentation, the development of fuel systems, cockpit heating and refrigeration systems, etc. It is important that applicants should have had workshop and drawing office experience.—Write, giving full particulars, to the Employment Officer, Gloster Aircraft Co., Ltd., Hucclecote, Glos. [9366]

APPLICATIONS are invited for the appointment of a production controller of an aircraft overhaul conversion works in the Midlands. The works employ some 250 personnel and, in addition to the main business of aircraft repair and conversion, it undertakes component production in its ancillary detail, woodmill and machine shops.—Applicants with sound experience of production control and workshop practices should reply with full details of age, qualifications and previous appointments held, to Personnel Officer, Field Aircraft Services, Ltd., Croydon Airport. [9379]

APPLICATIONS are invited for the appointment of a works superintendent to the aircraft overhaul and conversion works of Field Aircraft Services, Ltd., at their Nottingham unit. The appointment carries responsibility for the floor supervision of the complete works, including the ancillary detail and machine shops and control of 260 personnel.—Applicants with a wide experience of modern factory procedure and organisation should reply fully with details of experience, age, salary required, enclosing copy references to Personnel Officer, Field Aircraft Services, Ltd., Croydon Airport. [9378]

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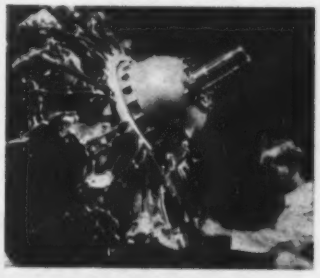

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SITUATIONS VACANT

ENGINEER with experience of the testing and maintenance of aircraft gyroscopic and servo equipment. Higher National Certificate standard of education.—Write fully, stating age, experience, to Box F.366, at 191, Gresham House, E.C.2. [8416]

BRITISH OVERSEAS AIRWAYS CORPORATION have vacancies for draughtsmen in their Design Office at London Airport covering all aspects of aircraft design development as affecting British and American aircraft, including unit and component conversion. Experience in radio installation work, electronics, hydraulics, modification and repair desirable. Knowledge of A.R.B. design requirements. A.E.S.D. rates of pay, attracting proficiency bonus where experience and qualifications allow. Good pension, sickness and holiday facilities.—Apply in first instance to the Manager, Ministry of Labour, Feltham, Middlesex. [8436]

EXPERIENCED electronic engineer required by the English Electric Co., Ltd., Luton, for investigation into the nature of mechanical vibrations in connection with guided missiles project. Position of responsibility in a new department is available for a well-qualified man. Adaptability and ability to develop electronic measuring techniques required. H.N.C. or equivalent and some experience of vibration work essential. Salary according to qualifications.—Please write, giving full details of qualifications and experience, and quoting Reference "EOC," to Central Personnel Services, English Electric Co., Ltd., 24-30, Gillingham Street, London, S.W.1. [8430]

MECHANICAL engineer required by the English Electric Co., Ltd., Luton, for vibration investigation on an important guided missile project. Previous experience of vibration work an advantage, but not essential. A sound grasp of mathematics and mechanics up to National Certificate standard is necessary, together with personal reliability and the ability to improvise. A working knowledge of electrical test equipment an advantage. Salary according to qualifications.—Please write, giving full details and quoting reference "English Electric 1000," to Westminster Employment Exchange, Chadwick Street, London, S.W.1. [8397]

ENGLISH ELECTRIC Co., Ltd., Luton, require senior and junior designers, capable of working with a minimum of supervision on design and development of hydraulic components, pneumatic components and aircraft fuel systems. Higher National Certificate or equivalent with practical and drawing office experience essential. Excellent prospects for advancement on a project of the highest priority. Salary £450 to £600, according to age, qualifications and experience. Suitable candidates without the specialised experience stated will be considered as trainees.—Please write, giving full details and quoting Ref. 491C, to Central Personnel Services, 24-30, Gillingham Street, London, S.W.1. [8340]

THE Aircraft Division of the English Electric Company, Ltd., at Warton Aerodrome, near Blackpool, requires structural test engineers for the development of aircraft structures and the investigation of fatigue problems associated with them. Applicants should have an engineering degree or H.N.C., have served an apprenticeship or have had experience of development of work on metal and plastic structures. Aircraft experience not essential. An opportunity also exists for those with academic qualifications alone to undertake theoretical work in conjunction with testing.—Please write, giving full details and quoting reference 494J, to Central Personnel Services, English Electric Company Limited, 24-30 Gillingham Street, London, S.W.1. [8434]

SITUATIONS VACANT

ENGINEER with experience of testing and maintenance of aircraft hydraulic systems and actuators. Higher National Certificate desirable.—Write fully, stating age, experience, to Box F.364, at 191, Gresham House, E.C.2. [8418]

SITUATIONS WANTED

SKILLED meteorologist requires position with aircraft company.—Box 1376. [8415]

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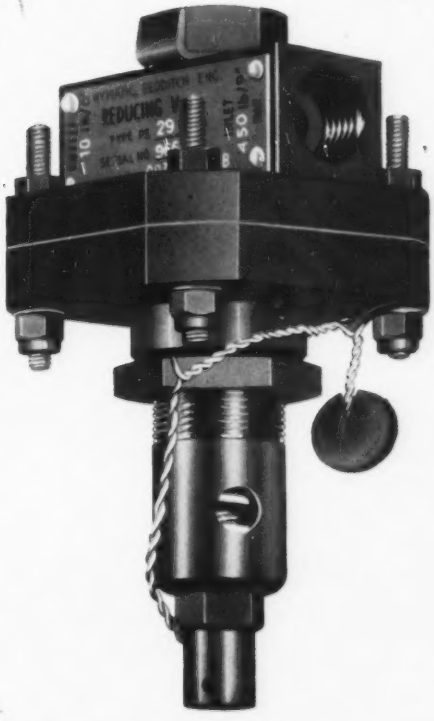

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